TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

June 21, 1985

Director of Nuclear Reactor Regulation

Attention: Ms. E. Adensam, Chief

Licensing Branch No. 4

Division of Licensing

U.S. Nuclear Regulatory Commission

Washington, D.C. 20555

Dear Ms. Adensam:

In the Matter of the Application of Tennessee Valley Authority

Docket Nos. 50-390 50-391

By letter dated May 30, 1985, the NRC requested information related to the Black and Veatch Independent Design Verification Program at Watts Bar Nuclear Plant. The enclosure to that letter consisted of five questions. The purpose of this letter is to provide a response to those five items.

Accordingly, the enclosure to this letter provides responses to the questions contained in the referenced letter. Due to the bulk involved, the attachments which are referenced in the enclosed responses were provided directly to NRC under separate cover on June 11, 1985.

If you have any questions concerning this matter, please get in touch with R. H. Shell of may staff at FTS 858-2688.

Very truly yours.

TENNESSEE VALLEY AUTHORITY

J. A. Domer, Chief Nuclear Licensing Branch

Sworn to and subscribed before me day of june

Notary Public

My Commission Expires

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Send Rec'd 7/5/85

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WSIC 11

Enclosure

cc: U.S. Nuclear Regulatory Commission (Enclosure)

Region II

Attn: Dr. J. Nelson Grace, Regional Administrator

101 Marietta Street, NW, Suite 2900

Atlanta, Georgia 30323

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ENCLOSURE
WATTS BAR NUCLEAR PLANT
RESPONSE TO QUESTIONS OF THE MAY 30, 1985,
NRC REQUEST FOR ADDITIONAL INFORMATION
ON THE BLACK AND VEATCH INDEPENDENT REVIEW

Question 1

TVA stated in a September 9, 1982 letter that the Black and Veatch (B&V) "confirmation of the adequacy of auxiliary feedwater (AFW) system will be compiled with broader, more comprehensive programmatic reviews (e.g., the Nuclear Safety Review Staff (NSRS) review of Watts Bar Nuclear Plant (WBN), United Engineers' design verification program review, Theodore Barry and Associates (TB&A) review of TVA's Office of Engineering Design and Construction (OEDC), etc.) to provide TVA with additional confirmation that WBN is, in fact, designed and constructed adequately even though deficiencies in the quality assurance program have been identified and resolved."

Documentation received to date does not indicate that the other reviews were relied upon in reaching your conclusions regarding the adequacy of the WBN. Therefore, we request that you provide your compilation of all these reviews which demonstrates your conclusions regarding how the WBN facility meets its licensing commitments. In addition, we ask that you submit those reports identified in your September 9, 1982 letter as well as any others you may have included in your evaluation.

Response

During the latter part of 1978, TB&A made a management performance review of OEDC. A copy of the one-volume report issued in December 1978 is provided in attachment 1. The review resulted in 115 recommendations to OEDC. These recommendations were assigned to managers in the OEDC organization and each was individually addressed.

During early 1980, TB&A performed a review of the OEDC implementation of progress on the 115 recommendations. The report dated February 1980 is a very good summary of the OEDC implementation. At that time some items were still in the process of being addressed. A second follow-up review of the OEDC implementation progress was performed early in 1981. The report dated March 1981 provides a final status on these recommendations as evaluated by TB&A. At the time of the second follow-up review, TB&A found that OEDC had implemented, or was in the process of implementing, 107 of the 115 recommendations. Some of the remaining 8 recommendations, such as assigning an overall OEDC project manager for each nuclear plant, were subsequently implemented. Some recommendations concerning responsibilities for licensing involved other offices within TVA and were never implemented. These three reports issued by TB&A management consultants give a good summary of their recommendations and the OEDC implementation. Copies of these follow-up reports are also provided in attachment 1.

Question 2

Discussions with your staff indicate that the TVA task force prepared evaluation sheets for the task force categories addressing the (B&V) findings. We request you submit those evaluation sheets for staff review.

Response

The evaluation sheets are provided with the response to question 4.

Question 3

Provide all internal TVA correspondence pertaining to the NSRS review of the B&V report, and the dispositions of their findings and recommendations. Does the NSRS concur with the final disposition of their recommendations? If not, provide reasons for non-concurrence and TVA's justification for closure of the item.

Response

NSRS participated in the B&V review through H. N. Culver, Director of NSRS. He was a member of TVA's policy committee for B&V. The policy committee was composed of senior TVA managers and charged with acting on the B&V finding and supplying information to B&V on the finding. The policy committee established and directed the task force (see question 2) that reviewed the B&V findings for generic applicability to WBN systems other than AFW. The October 7, 1982 memorandum establishing the policy committee with Mr. Culver as a member is provided in attachment 2.

Also provided in attachment 2 are 11 internal TVA memorandums documenting meetings of the B&V policy committee.

Mr. Culver's attendance is noted in the minutes. He participated actively in the functioning of the committee and the deliberations of the committee.

In addition to participating in the meeting that is documented, there was frequent contact between the chairman of the policy committee and the individual members of the policy committee. During these contacts the chairman would obtain advice and consent on TVA responses to level II B&V findings. Mr. Culver was a key resource in this endeavor.

The evaluation of the B&V review and the review for generic applicability to WBN was the responsibility of the policy committee. Mr. Culver and J. W. Anderson, Manager of Quality Assurance, were both deeply involved in the preparation, drafting, and review of the report of this generic evaluation. The report was submitted to NRC on March 29, 1984 by D. S. Kammer's letter to Ms. Adensam. The signatures on the cover of that report, including Mr. Culver's, attest to the policy committee's review and approval of the report.

Attachment 3A - This attachment provides corrective actions (NCRs, engineering change notices (ECNs), field change requests (FCRs), and commitment tracking records) identified as the result of the B&V findings. We have not included those for the corrective action which was documented as complete and included in the B&V reports.

The contents of attachment 3A are listed below:

Nonconformance Reports	Engineering Change Notices
WBNEEB8104 WBNCEB8204 WBNEEB8208 GENCEB8213 WBNCEB8215 WBNCEB8222R1	2576 3198 3210 3306 3507
WBNCEB8232 WBNSWP8252R3 WBNSWP8262	3636 Field Change Notices
WBNSWP8272 WBNSWP8273 GENNEB8301 WBNSWP8301	H-7597 H-7618 H-8083
GENCEB8302 WBNSWP8305 WBNSWP8309 WBNSWP8312	H-8236 H-8404 H-8721
WBNEEB8401	Commitment Tracking Records WBN-R189 WBN-R190 WBN-R266

Attachment 3B - This attachment provides documentation of completed corrective action identified during accomplishment of the task force generic evaluation. This documentation includes corrective action for past and future work.

Part 1 of attachment 3B contains a copy of the task force report (EDC 840320 402). The report explains the task force objectives and methodology and contains the 25 category evaluation sheets. Each category evaluation is complete except for item 12A/B ("Verification of Effectiveness of Corrective Action for Future Work"). The responsibility for completing this item was assigned to the Quality Management Staff (QMS).

Part 2 of attachment 3B contains a package of information for each category. Each package includes:

- a copy of the completed evaluation sheets including item 12A/B completed by ${\sf QMS}$,
- QMS surveillance report for the assessment of item 12A/B for each category,
- documentation (including modified procedures) to verify the accomplishment of corrective action for past and future work identified for each category.

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

June 21, 1985

Director of Nuclear Reactor Regulation

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Licensing Branch No. 4

Division of Licensing

U.S. Nuclear Regulatory Commission

Washington, D.C. 20555

Dear Ms. Adensam:

In the Matter of the Application of Tennessee Valley Authority

Docket Nos. 50-390 50-391

7/31/85 TE- 2nd Request
7/31/85 TE- 1/5/25 Displaced
By Contractor

By letter dated May 30, 1985, the NRC requested information related to the Black and Veatch Independent Design Verification Program at Watts Bar Nuclear Plant. The enclosure to that letter consisted of five questions.

Accordingly, the enclosure to this letter provides responses to the questions contained in the referenced letter. Due to the bulk involved, the attachments which are referenced in the enclosed responses were provided directly to NRC under separate cover on June 11, 1985.

If you have any questions concerning this matter, please get in touch with R. H. Shell of may staff at FTS 858-2688.

The purpose of this letter is to provide a response to those five items.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

J. A. Domer, Chief

Nuclear Licensing Branch

Sworn to and subscribed before me this a / at day of 1985

Notary Public

My Commission Expires

mels Red 7/5/85

Enclosure

cc: U.S. Nuclear Regulatory Commission (Enclosure)

Region II

Attn: Dr. J. Nelson Grace, Regional Administrator

101 Marietta Street, NW, Suite 2900

Atlanta, Georgia 30323

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ENCLOSURE
WATTS BAR NUCLEAR PLANT
RESPONSE TO QUESTIONS OF THE MAY 30, 1985,
NRC REQUEST FOR ADDITIONAL INFORMATION
ON THE BLACK AND VEATCH INDEPENDENT REVIEW

Question 1

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Response

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Also provided in attachment 2 are 11 internal TVA memorandums documenting meetings of the B&V policy committee.

Mr. Culver's attendance is noted in the minutes. He participated actively in the functioning of the committee and the deliberations of the committee.

In addition to participating in the meeting that is documented, there was frequent contact between the chairman of the policy committee and the individual members of the policy committee. During these contacts the chairman would obtain advice and consent on TVA responses to level II B&V findings. Mr. Culver was a key resource in this endeavor.

The evaluation of the B&V review and the review for generic applicability to WBN was the responsibility of the policy committee. Mr. Culver and J. W. Anderson, Manager of Quality Assurance, were both deeply involved in the preparation, drafting, and review of the report of this generic evaluation. The report was submitted to NRC on March 29, 1984 by D. S. Kammer's letter to Ms. Adensam. The signatures on the cover of that report, including Mr. Culver's, attest to the policy committee's review and approval of the report.

Attachment 3A - This attachment provides corrective actions (NCRs, engineering change notices (ECNs), field change requests (FCRs), and commitment tracking records) identified as the result of the B&V findings. We have not included those for the corrective action which was documented as complete and included in the B&V reports.

The contents of attachment 3A are listed below:

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WBNCEB8204	3198
WBNEEB8208	3210
GENCEB8213	3306
WBNCEB8215	3507
WBNCEB8222R1	3511
WBNCEB8232	3636
WBNSWP8252R3	
WBNSWP8262	Field Change Notices
WBNSWP8272	
WBNSWP8273	H-7597
GENNEB8301	H-7618
WBNSWP8301	H-8083 +
GENCEB8302	н-8236
WBNSWP8305	H-8404
WBNSWP8309	H-8721
WBNSWP8312	St. 1
WBNEEB8401	Commitment Tracking Records
	WBN-R189
	WBN-R190
,	WBN-R266

Attachment 3B - This attachment provides documentation of completed corrective action identified during accomplishment of the task force generic evaluation. This documentation includes corrective action for past and future work.

Part 1 of attachment 3B contains a copy of the task force report (EDC 840320 402). The report explains the task force objectives and methodology and contains the 25 category evaluation sheets. Each category evaluation is complete except for item 12A/B ("Verification of Effectiveness of Corrective Action for Future Work"). The responsibility for completing this item was assigned to the Quality Management Staff (QMS).

Part 2 of attachment 3B contains a package of information for each category. Each package includes:

- a copy of the completed evaluation sheets including item 12A/B completed by QMS,
- QMS surveillance report for the assessment of item 12A/B for each category,
- documentation (including modified procedures) to verify the accomplishment of corrective action for past and future work identified for each category.

ATTACHMENT 2

ADDITIONAL ATTACHMENTS REFERENCED IN
THE RESPONSE TO QUESTION 3
ON THE BLACK AND VEATCH INDEPENDENT
DESIGN VERIFICATION PROGRAM AS FORWARDED
IN THE MAY 30, 1985, LETTER FROM
T. M. NOVAK TO H. G. PARRIS

ULITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

Those listed

EDC '82 1007 005 JPK

FROM : G. H. Kimmons, Manager of Engineering Design and Construction, W12A9 C-K

SO 15

AH

DATE : October 7, 1982

SUBJECT: WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW BY BLACK AND VEATCH COMPANY

Reference: Memorandum from Sprouse to me dated 9/14/82 (NEB 820914268):

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The referenced memo reported arrangements that have been made for OEDC to review Black and Veatch findings. This level one review by TVA will be after the initial review by Black and Veatch. A second review by TVA may be desirable after Black and Veatch reviews the findings taking into consideration TVA's input from the level one review. You are well aware that the results of this independent review are most important to the licensing of Watts Bar and will have very high visibility. In reaching their conclusion, Black and Veatch should have the best information available. I consider it very important that you have the opportunity to express your personal views on each of the findings where your views are relevant to their reaching the correct conclusion.

We have arranged for Black and Veatch to submit to OEDC each finding after the second review is performed by the assistant project manager in Knoxville. We must use the opportunity that exists during this submittal to express any personal views you feel relevant. In addition, there will probably be times when it is important that we meet as a body and consider expressing views on particular findings or situations.

I am naming a policy committee to be available as necessary to act on findings as a body and to supply information to Black and Veatch on findings which merit this level of attention. In addition, each of you as a member of this policy committee will be given the opportunity to comment on the findings. I have asked E. G. Beasley to serve as chairman of this committee and the following persons will serve as members:

J. W. Anderson, Manager of Quality Assurance; R. M. Pierce, Watts Bar Project Manager, OEDC; H. H. Mull, Manager of Construction; M. N. Sprouse, Manager of Engineering Design; and H. N. Culver, Director of NSRS.



VALLEY MUTHOR

Those listed October 7, 1982

Manager of Quality in erbone, OEDO, W1232ft C-Kryg

WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW BY BLACK AND VEATCH COMPANY

A MANT - INDEPENDING RVIEW POLICY COMMITTEE OF SOLICE

As OEDC receives each of the Black and Veatch findings after review by the assistant project manager in Knoxville, E. G. Beasley will work directly with the OEDC Program Manager on items needing the attention of the policy committee as a body. On specific findings that may be relevant to you individually, he will contact you directly and consult, as necessary, with the OEDC Program Manager and the Program Team.

esent wate J. W. Anderyon, H. N. Culvir, H. H. Mull. halfsprouse, and 2. Go Reasley; others present were H. L. Johas, D. . . Fatterson, and J. A. Raulston.

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E. G. Beasley, W12B26 C-K

H. N. Culver, 249A HBB-K work of become and a fine and the control of the control of

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G. F. Dilworth, El2D46 C-K bos (sective in ngiend

H. G. Parris, 500A CUBB-C

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Memorandum

TENNESSEE VALLEY AUTHORITY

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OEDC QA Files

E. Gray Beasley, Manager of Quality Assurance, OEDC, W12B26 C-K

WATTS BAR MUCLEAR PLANT - COURT REVIEW BY BLACK

DATE November 3, 1982

SUBJECT: WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW POLICY COMMITTEE

As DEDO seceives each of the Book and Castch Finder

Reference: G. H. Kimmons memo, to Those, listed, 10/7/82 (EDC 821007,005)

The Watts Bar Independent Review Policy Committee met on November 2: 2: 2: 2 1982. Members present were J. W. Anderson, H. N. Culver, H. H. Mull, R. M. Pierce, M. N. Sprouse, and E. G. Beasley; others present were R. W. Cantrell, H. L. Jones, D. R. Patterson, and J. A. Raulston.

The present status of the Black & Veatch review was reported. As of November 2, 184 findings have been transmitted to TVA. To date, TVA has responded to 32 of these findings on the Level 1 review and to 9 on the Level 2 review. Of the 184, 111 were classified as open; 59 were classified as confirmed; and 14 were classified as resolved that it

Examples of findings were presented to show the typical spectrum of findings. Examples included: findings of important concerns; findings of nil technical or regulatory concern; findings where FSAR commitments were not met; findings where something was done that was not spelled out in the FSAR; findings where the actual field installation was not in accordance with design drawings; and identical findings on separate pieces of equipment. H. C. Parris, 500A CUBB-C

The committee discussed several possible immediate actions which will enable TVA and B&V to deal with the findings effectively and expeditiously. It was agreed that:

- o We would formally increase the TVA review time from 2 working days to 7 working days. This increase in time is both applied to Level 1 and Level 2 reviews.
- o We would suggest to B&V that they consider grouping similar findings such that the group can be tracked as a package. If B&V does this grouping, we would prefer it be done prior to the Level 2 submittal so that TVA could be aware of the grouping.
- o Many of the findings could be related to situations where TVA work is still in progress. It was agreed that the Program Manager would instruct the responsible reviewers to be certain to identify all cases where the finding refers to work still in progress.

OEDC-QA Files ONOvember 2-1982

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WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW POLICY COMMITTEE

The actual schedule for completing the work will have to slip due to the additional review time. B&V will be formally requested to modify the procedures to allow for the additional review time which will result in their schedule being modified for completing the report. It was semphasized that the field review should be completed on site on schedule on November 3 and in EN DES on November 5.000 70115

epenieut Review Policy Committee met . December 2, 1932.

J.W. Aoderson, R. W. Gulver, H. H. Mull, R. M. Sterce,

Becsley. Whers present were: R. W. Cantrell, H. L.

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E. Gray Beasley.

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cc: J. W. Anderson, 902 HBB-K

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conditions adverse fairty was considered under agenda iterated that we would and itserated that the engineering and issue NCRs where we coprise with itradees as proposed for iteration while well to the love the review to mequestythe team considered it appears that the life procedures were not posing the ware it appears that the life procedures were not posing the ware it.

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UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

OEDC MO Files

EDC 8 82 1206

FROM

E. Gray Beasley, Assistant to the Manager of Engineering Design and Construction, W12A6 C-K

DATE

December 6, 1982

SUBJECT:

WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW POLICY COMMITTEE and said

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Reference: G. H. Kimmons memorandum to Those Listed dated October 7, 1982 (EDC 821107 005). redesered as 230 MS mi bos 2 redmeyoN as

The Watts Bar Independent Review Policy Committee met on December 2, 1982. Members present were: J. W. Anderson, H. N. Culver, H. H. Mull, R. M. Pierce, M. N. Sprouse, E. G. Beasley. Others present were: R. W. Cantrell, H. L. Jones, D. R. Patterson and J. A. Raulston.

Attachment 1 is an agenda for the meeting. Attachment 2 is the first page of a tracking log which I maintain. Item 1 of the agenda was a brief status of the overall independent review effort.

Agenda item 2 was discussed at length. The possibility of meeting with B&V on findings where there is a technical diagreement between B&V and TVA was discussed. It was agreed to not consider such meetings at this time. Where there is a technical disagreement the level 2 response will elaborate on the TVA position and the appropriate branch chief or comparable position will be requested to concur on the level 2 response. In addition, the level 2 response will request B&V to recycle the finding if the finding is not recategorized as resolved.

Under agenda item 3 it was noted that we had approximately 25 findings where B&V had identified an inconsistency between TVA drawings such as between the logic diagram and the connection diagram. It was agreed that responses to the level 1 finding would confirm the finding if it was fact, note whether or not the installation was correct, and cite the NCR, ECN, or FCR being used to bring the drawings into agreement.

It was also agreed that NEB would draft a generic response to use on level 2 findings of this nature. The wording on these items is extremely sensitive and the program manager should work through the grouphead and branch chief where it is difficult in getting a level 1 response that is properly worded.

Identification of conditions adverse to quality was considered under agenda item 4. It was reiterated that we would adhere closely to the engineering procedures and PRM and issue NCRs where appropriate. H. L. Jones as program manager has the authority while making the level 1 review to request the team member to reconsider where it appears that the NCR procedures were not being followed.

B&V classify each finding as open, resolved or confirmed. They now classify as resolved findings that identify minor discrepancies such as typos and findings of minimum consequence. The resolved category is also being used for findings for items where installation, inspection, and documentation are not complete.



OEDC MO Files December 6, 1982

POLICY EC WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW POLICY COMMITTEE

Twenty-eight level 2 findings have been classified as confirmed. Additional information may result in some of these findings being classified as resolved. A few findings have been identified where the design and construction are not consistent with the license application. states

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2620 0035 On findings where installation, inspection and documentation are complete, B&V is to classify as resolved and identify as item on a punchlist. When TVA receives this punchlist, it will be compared to the accountability program to assure the B&V punchlist item is in the TVA system, then the item or punchlist not tracked further as a B&V item.

Tehniosi Disagrasaest Where TVA commits to some action other than the B&V punchlist on incomplete items the corrective action will be tracked as an NCR, ECN or FCR. If an NCR. ECN or FCR is not appropriate then a CTR will be issued and tracked to closure. The NCR, ECN, FCR and CTR will be identified by number in the OEDC log and the log maintained as a record.

It was noted that informal discussion with B&V had indicate the earliest possible date for the final report as January 15. The January 15 date is based on all level 1 responses being back to B&V by December 7. While there is a concern for the schedule, it was agreed that quality responses take precedent over schedule. Goals of December 10 and December 17 ware set for all level 1 responses being in the hands of the program manager and returned to Black and Veatch, respectively.

THE TO SUCHELLY

noiseA.282 0030 event See Soular E. Gray Beasley

EGB:WBW Attachments

cc (Attachments):

J. W. Anderson, 902 HBB-K

H. N. Culver, 249A HBB-K

G. H. Kimmons, W12A9 C-K

MEDS, W5B63 C-K

H. H. Mull, E7B24 C-K

R. M. Pierce, 104 ESTA-K

M. N. Sprouse, W11A9 C-K

POLICY COMMITTEE BLACK AND VEATCH - INDÉPÉNDENT REVIEW OF WATTS BAR NÚGLÉAR PLANTITAL DECEMBER 2, 1982 - MEETING AGENDA

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VI. Tracking of Items Where OEDC Has Action

VII. Schedule

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G. H. Kimmons, W12;3 MEDS, W5463 C-X M. H. Mull, EYECE U-H. M. Pitroe, 104 To M. A. Sprouss, W11;

Review of Watts Bar - Black & Veatch Findings

	Level 1	Response	Level 2	Response	Comments*	C/A Required	C/A i Gentification	Responsible Person
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F120					0 A	No		L. T. Perry
F121	10/29/82	11/2/82			0 A	,	•	E. H. Cole
F122	10/29/82					•	•	E. H. Cole
F123	10/29/82				<u>0 A</u>			

^{*}Type: O - Open C - Confirmed R - Resolved *Category: A - Safety-Related B - Non-Safety-Related

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UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

OEDC MO Files

EDC 821228 402

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FROM

E. Gray Beasley, Assistant to the Manager of Engineering Design and

Construction (Quality and Nuclear Safety), W12A6 C-K

DATE

December 28, 1982

SUBJECT: WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW POLICY COMMITTEE

Reference: G. H. Kimmons' memorandum to Those listed dated October 7, 1982 (EDC 821007 005).

The Watts Bar Independent Review Policy Committee met on December 17, 1982.

Members present were: J. W. Anderson, H. N. Culver, H. H. Mull, R. M. Pierce,
M. N. Sprouse, and E. G. Beasley. Others present were: R. W. Cantrell,
H. L. Jones, R. A. Pedde and J. A. Raulston.

The log of B&V findings status was distributed; that log was current as of December 17. A summary status sheet (Attachment 1) was discussed by H. L. Jones. There was general discussion concerning the delays in responding in both level 1 and level 2 findings. Both EN DES and CONST indicated they expect to clear all level 1 responses during the week of December 20.

H. L. Jones reported that in a recent telecon with B&V that B&V had indicated that we should anticipate receiving the final report near the end of March. This March date is based on past trend rates for handling the finding. By TVA getting all responses to B&V by December 17 and an accelerated rate on both the part of TVA and B&V it may be possible to get the report out by the end of February (all level 1 responses were not in by December 17, 1982). There was no strong concern expressed about the March date for the final report; even though there was considerable concern on the timeliness of handling the individual items.

OQA's concerns expressed in McDonald's memorandum to Jones and Kidd were discussed (see Attachment 2). It was agreed that corrective action would be taken on all B&V findings where there is a discrepancy even though the finding may be categorized as "Resolved" by B&V. OQA also identified some programmatic concerns relative to the findings. It was agreed that these concerns would be resolved within OEDC-OQA without involving B&V.

Two proposed level 2 responses to finding 504 were considered (see Attachment 3). After general discussion it was agreed that where there is a specific deviation from a FSAR commitment the level 2 response will acknowledge that the design and construction did not agree with the license and that we would attach general information explaining the importance of the deviation to nuclear safety.

It was also noted that F504 resulted in a significant NCR that was determined to be nonreportable based on the importance to nuclear safety. It was generally agreed to not give specific consideration to reportability even though there was a direct violation of a FSAR commitment.

OEDC MO Files December 28, 1982

WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW POLICY COMMITTEE

A proposed response to F507 (Attachment 4) was discussed. There were strong feelings that we should not constrain B&V by responding as proposed. The attached level 2 response was withdrawn and the F507 returned to SWP and CEB to gather the EDS information B&V requested.

In the previous policy committee meeting the committee asked NEB to draft an attachment to use on level 1 responses where the finding identified a discrepancy between the detailed design drawing and the criteria drawing. A copy of the NEB effort is included as Attachment 5. Persons present were requested to forward any comments to NEB by 8 a.m. on December 21. NEB and H. L. Jones will then use the attachment for the appropriate level 1 responses.

E. Gray Beasley

EGB:WBW

Attachments

cc (Attachments):

J. W. Anderson, 902 HBB-K

H. N. Culver, 249A HBB-K

G. H. Kimmons, W12A9 C-K

MEDS, W5B63 C-K

H. H. Mull, E7B24 C-K

R. M. Pierce, 104 ESTA-K

M. N. Sprouse, W11A9 C-K

AS UF 12/17/82:

TOTAL
NUMBER
<u>FINDINGS</u>

LEVEL 1 RESPONSE RECEIVED FROM B&V FOR LEVEL 2 REVIEW

LEVEL 2 RESPONSE

149

428

264

202 -

124 RESOLVED

38 OPEN

40 CONFIRMED

ELECIRICAL/CONTROL

MECHANI CAL

SIRUCTURAL

FIELD

TUTAL

45 (10.5%)

75 (17.5%)

14 (3.3%)

294 (68.7%)

428

TVA 64 (CS-9-65) UNITED STATES GOVERNMENT

0QA 821210 300

Memorandum

TENNESSEE VALLEY AUTHORITY

M. Kidd, Program Management Group Head, 301 HBB-K

H. Jones, Project Manager, WBN Independent Review, W10A17 C-K

J. A. McDonald, Chief, Quality Improvement Staff, 238 MIB-K FROM:

December 10, 1982

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WBN INDEPENDENT REVIEW SUBJECT:

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*100	*111	328	337	500	769
*104	*115	329	338.	501	*777
*106	139	331	356	505	795

From this sample, the areas I feel we and/or B&V are not being sensitive to are:

- o Uniform accuracy of the drawing control system to support the operating phase activities (design and operation) not just construction activities. (F-104, -106, -111, -115)
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In Donald

JAM: VCT

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cc: MEDS, W5B63 C-K

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TVA 64 (CS-9'65)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

OEDC MO Files

EDC 821228 402

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: E. Gray Beasley, Assistant to the Manager of Engineering Design and

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TVA 64 (CS-9-65)

TO

UNITED STATES GOVERNMENT

OQA 821210 300

Memorandum

TENNESSEE VALLEY AUTHORITY

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J. A. McDonald

JAM: VCT

cc: MEDS, W5B63 C-K

FORM 2

WATTS BAR NUCLEAR PLANT INDEPENDENT REVIEW

FINDING RESPONSE

Date finding received from Black & Veatch

Finding number 1715/014/

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An Expended Discussion of Black & Veatch Finding F504

The Commitment Defined

Section 3.7.2.1.1 of the Watts Bar Final Safety Analysis Report (FSAR) makes the following statement: "For axisymmetric structures, an eccentricity of 5 percent of the diameter was assumed." An explanation follows.

Consider a cylindrical containment vessel with a spherical dome, as shown in figure 1. It is nominally symmetric about its central vertical axis. To meet the commitment, the analyst would assume an arbitrary offset (equal to 1/20th of the diameter of the structure) of the center of mass, M, from the center of the structure, C. Since the mass is then eccentric to the center of twisting (known as the shear center), base ground motion (such as an earthquake) along the + and - y axes in figure 1 will induce both lateral shear forces and torsion in the structure. The eccentric mass will also result in the formation of vibration modes involving simultaneous (or coupled) translational and rotational motion.

The intent of this commitment was to account for asymmetry due to:
(1) construction tolerances and (2) eccentric mass distribution of supported subsystems (such as piping, hatches, ladders, etc.). The historical source of the 5-percent figure (e.g., why not 1 percent or 2 percent?) is the uniform building code (UBC). In commercial buildings designed by the UBC, the potential for eccentricities in mass center due to asymmetric floor loadings and shifts in shear center due to the effects of interior walls is much greater than for nuclear containment structures.

The Watts Bar Steel Containment Vessel Seismic Analysis

Rather than apply the arbitrary 5-percent eccentricity, the analyst calculated <u>actual</u> eccentricies at various levels of the structure. The most significant of these were due to hatches, although, at most, the eccentricities are equal to approximately 1 percent of the diameter. Thus, part 2 of the intent of the commitment was met. TVA has considerable data supplied by the designer and constructor of the vessel (Chicago Bridge and Iron Company) to show that the structure has insignificant additional eccentricity due to construction tolerances.

The Effect of Not Meeting the Commitment

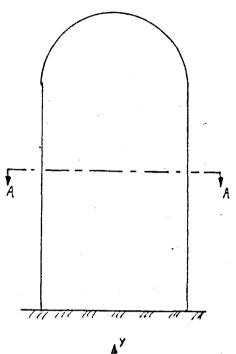
In those instances where TVA has used 5-percent eccentricity on cylindrical structures, the effect has been shown to be small. One way of expressing the effect of including the 5-percent eccentricity is to compare the motion of a point on the shell (shown as "+R" in section A-A, figure 1) to the motion of the center of the cylinder, C. If the torsional effects are significant, the motion of these two points will be signicantly different. Figure 2 is a response spectrum plot of these two points for the seismic

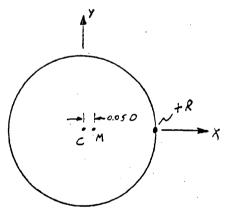
analysis of the Bellefonte Nuclear Plant secondary containment structure. (It is a plot of the peak acceleration of subsystems of various frequencies attached to the structure.) Since the two points have almost identical response spectra, the effect of considering the 5-percent eccentricity is seen to be small.

This effect should be even less for the Watts Bar Nuclear Plant containment vessel, since its first torsional vibration mode is at approximately 15 hertz (cycles per second), compared to the 10 hertz coupled torsional-translational mode for the Bellefonte secondary containment and since there is considerably less seismic ground motion input at 15 hertz than at 10 hertz.

Summary

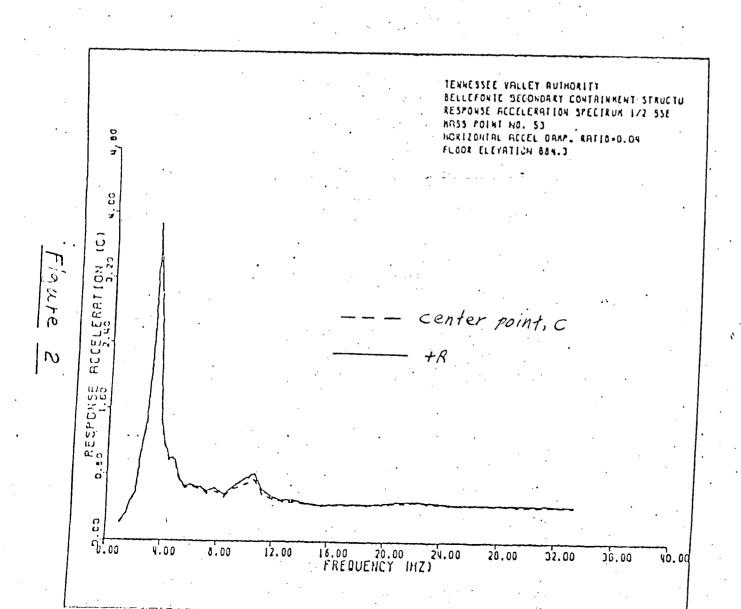
- 1. The FSAR commitment was not met.
- 2. The original intent of the FSAR commitment was met.
- 3. The effect of not meeting the FSAR commitment is minimal.





Section A-A

Figure 1



FORM 2

WATTS BAR NUCLEAR PLANT INDEPENDENT REVIEW

FINDING RESPONSE

Date finding received from Black & Veatch

Date

Date

Finding number /F/5/0/7/

Comments pertinent to finding:
With respect to contractors, vendors, and suppliers, it is TVA's understanding that the B&V independent review is limited to review of the interfaces with contractors, vendors, and suppliers. This review of the interface is to confirm that the requirements, data and information supplied to TVA was correctly incorporated in the design and construction of the auxiliary feedwater system.
It was not necessary to review Westinghouse detailed calculations that established the auxiliary feedwater flow rate. It was only necessary to confirm that TVA had designed and constructed the auxiliary feedwater system to deliver the flow rate which was a commitment in the FSAR.
Similiarly, the Black & Veatch review need only to confirm that TVA gave EDS the proper data and that the results EDS submitted to TVA were correctly incorporated in the design.
Chairman, GEDC Policy Committee Date
OEDC Program Manager Date
Date finding response transmitted to Black & Veatch

IDENTIFICATION OF DRAWING DISCREPANCIES

Discrepancies between conceptual and detail drawings which are significant to the system's operation and which have not been found and corrected during design and installation have a high probability of being discovered and resolved in the review and testing associated with construction testing and preoperational testing. This is explained in the following.

Construction Testing

Construction testing activities prior to transfer of the system from CONST to NUC PR would detect certain types of design errors which would cause the components of the system to function improperly.

The construction test program demonstrates that tested structures, systems and components will perform satisfactorily when preoperationally tested and put into service. This construction test program concentrates on the verification that the installed "system" as well as the "element" will function properly. The construction tests are performed on systems and components of unlicensed nuclear units to satisfy prerequisites to the preoperational test program. These include pressure and other integrity tests, component, and piping system cleaning and flushing, equipment checkout, and initial operation and adjustments.

Construction conducts the tests with the assistance and support of NUC PR, and prepares a test results package containing all collected test data. This test package if reviewed by CONST QA, the responsible engineer, and the designer and NUC PR as appropriate. The validity and acceptance of the test is verified, and the test results package becomes a QA document, which is filed in the Quality Control Records Unit.

If a drawing discrepancy is discovered during construction testing, then a Nonconformance Report (NCR) and/or Field Change Request (FCR) is initiated by CONST. NCRs originated because of drawing discrepancies will be referred to EN DES for resolution with entries indicating CONST's recommended disposition. These NCRs are transmitted from the CONST project manager to the EN DES project manager. The EN DES project manager transmits the NCR to the appropriate group in design to be dispositioned. Following a technical review of the conditions described by the NCR form, EN DES will either concur with CONST's recommended disposition or will issue a revised disposition.

The FCR process is described in the section on change control.

Preoperational Testing

The preoperational testing program for systems important to safety should detect design errors that may not be evident during construction testing, but would otherwise prevent proper operation of the system.

The preoperational testing program verifies that the plant systems and features important to nuclear safety meet an established set of acceptance criteria and prove these systems and features can perform their intended safety functions as designed.

Prior to preoperational testing, the test record drawings are reviewed by CONST, EN DES, and NUC PR. The test record drawings typically include the detailed construction drawings, the instrument tabulation drawings, and the more comprehensive flow and control drawings (and often the logic drawings as well). The "as-constructed" status of these drawings at the time of preoperational testing are prepared by CONST (using either drawings already under configuration control or specially reviewed to show the construction status) and reviewed by the EN DES test representative to assure that the "as-constucted" system is appropriate for testing. The EN ES test representative who is responsible for this evaluation is generally from the branch or project which has engineering or design responsiblity for the system or feature being tested. If there are drawings outside of his area of expertise, the test representative is responsible to see that proper review is given to those drawings by design engineers who are knowledgeable in that subject. At the conclusion of testing the NUC PR test director verifies that the test record drawings were those used in the conduct of the test.

The data taken during testing is collected in a test results package. The test results package consists to the issued preoperational test instruction with each signoff point signed and dated to verify the actions taken, all data sheets, instruction change sheets, test

deficiencies and exceptions, appendices, a daily log of the testing, and the test record drawins which document the configuration of the plant features at the time of testing.

Drawing discrepancies which would cause the system to deviate in the test from its designated performance would be detected in the performance and review of the preoperational test and identified as preoperational test deficiencies.

During testing as test deficiencies occur, NUC PR transmits to EN DES a test deficiency report. This allows EN DES to expeditiously take whatever action is required to resolve the deficiency and to allow retesting if necessary to demonstrate acceptable performance. The test deficiency is formally documented in the test results package which includes a description of the deficiency, a copy of the report form, and the resolution of the deficiency.

When the testing is completed and the results package has been compiled, NUC PR evaluates the results and identifies any items which still require resolution. The package is then transmitted to EN DES. EN DES reviews the complete results package to verify that the testing performed demonstrated that the system or feature is functioning as designed and that the acceptance criteria were met. As a part of its review, EN DES evalutes any open items identified by NUC PR and establishes an acceptable schedule for determining the resolution of these items and for implementation of the resolution. The preoperational test is not completed until EN DES has given final

approval to the results package. Additional information on the preoperational test program is given in EN DES-EP 6.01, "Preoperational Testing Documents - Processing," and ID-QAP-11.1, "Preoperational Testing."

Change Control

The design change control process includes procedures for processing of Field Change Request (FCRs) initiated by the Division of Construction. The FCR process is typically utilized to provide timely resolution of minor construction problems related to interferences, tolerance adjustments, minor drawing discrepancies, etc. The scope of exhanges which can be processed via the FCR process is strictly limited to ensure that changes are properly controlled. The FCR process involves the responsible construction engineering unit initiating the FCR and contacting the responsible design engineer in the EN DES design project. The design engineer has the authority to verbally approve or disapprove the change request. The design engineer also has the authority to request more information, such as marked up drawings, sketches, etc., if he feels this is required to reach a proper decision. If approved, the construction engineer proceeds to implement the change and submits the FCR package, including agreed to sketches or drawings, to the EN DES design project for incorporation into a future drawing revision.

In addition to the ECN and FCR processes, TVa utilizes a Design Change Request (DCR) process whereby plant operational personnel from the Division of Nuclear Power (NUC PR) can request changes to the issued

design. Typically, plant operations personnel are not actively involved during the development of detailed design and only become involved during the operator training cycle and during preoperational testing. This process provides a mechanism for plant staff and operations personnel to initiate changes which they feel would improve plant operability or which would corrrect design discrepancies. Once a DCR is approved, an ECN is initiated to control and implement the change.

Summary

In summary, the construction testing program, the preopertional test record drawing review, the conduct and evaluation of the preoperational tests, and the drawing change programs together provide a high degree of confidence that drawing discrepancies with any safety significance will be discovered, evaluated, and appropriately corrected.

E52340.05

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

OEDC MO Files

EDC '830301 401

FROM

E. Gray Beasley, Assistant to the Manager of Engineering Design and

Construction, W12B21 C-K

DATE : March 1, 1983

SUBJECT: WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW POLICY COMMITTEE MEETING

The Watts Bar Independent Review Policy Committee met on February 18, 1983. Members present were: J. W. Anderson, E. G. Beasley, C. Bonine, H. N. Culver, R. M. Pierce and M. N. Sprouse. Others present included: H. L. Jones, M. S. Martin, D. R. Patterson, J. A. Raulston and J. E. Wilkins.

The status and schedule of the B&V independent review were briefly noted. All level 1 responses were completed and returned to B&V on or before February 14, 1983. The return of the level 2 responses to B&V complete the OEDC interface with B&V until the B&V report is issued. We have received 178 level 3 comments from B&V. Our informal information indicates that B&V will complete their level 3 reviews by March 9 or 10 and will issue the report by the end of March.

It was noted that B&V had properly and adequately accomplished their specific contract requirements; that is, that they performed a review to allow them to reach a conclusion that the auxiliary feedwater system meets the license application requirements and notes any exceptions. In doing this it appears that B&V has not identified all possible ramifications from the findings.

H. L. Jones passed out a list of 10 observations and conclusions and discussed them in some detail. The findings involve a number of ECNs and NCRs; 18 ECNs have been written. Approximately 24 NCRs have been written—about half of which are significant and three reportable. The findings also identified concerns previously noted on eight significant NCRs—seven of which had been reportable. Approximately one—fourth of the findings were involved with the NCRs. The remainder of the findings is of minimal or of no concern.

Each finding that required corrective action has had that corrective action identified for it and the corrective action is being tracked in the appropriate log. B&V is developing a punchlist; the B&V punchlist items will need unique identification and closure. When the punchlist arrives, H. L. Jones will work with the responsible person to assure each punchlist item gets in an appropriate tracking system or is specifically identified as being closed.



OEDC MO Files March 1, 1983

WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW POLICY COMMITTEE MEETING

Due to the high visibility of the B&V report and Region II's recently identified concerns for promptness it appears appropriate for OEDC to identify and initiate any programmatic changes or adjustments prior to receipt of the B&V report. In addition, where there appears to be disagreement with the license application OEDC needs to take the appropriate steps to assure that the more important conditions are endemic to the auxiliary feedwater system. It was mutually agreed among the policy committee members that these actions should be undertaken immediately. It was agreed that EN DES would take the lead and OQA and CONST would assist.

The policy committee agreed to meet as soon as this organization has developed a course of action so that concurrence could be obtained.

<u>Post Meeting Note:</u> Task force under the leadership of Henry Jones and comprised to John McDonald, Bob Olson, Don Denton and Ed Cole began working on Tuesday, February 22.

E. Gray Beasley

EGB:WBW

cc: J. W. Anderson, M155G MIB-K

C. Bonine, E7B24 C-K

H. N. Culver, 249A HBB-K

D. R. Patterson, W12A7 C-K

R. M. Pierce, 104 ESTA-K

M. N. Sprouse, W11A9 C-K

MEDS, W5B63 C-K

tva 44 (06-9-49) United States Government

Memorandum

830307E0166



TENNESSEE VALLEY AUTHORITY

EDC '830304401

TO

OEDC MO Files

FROM

E. Gray Beasley, Assistant to the Manager of Engineering Design and

Construction, W12B21 C-K

DATE

March 4, 1983

SUBJECT:

WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW POLICY COMMITTEE MEETING

The Watts Bar Independent Review Policy Committee met on February 28, 1983. Members present were: J. W. Anderson, E. G. Beasley, C. Bonine, H. N. Culver, R. M. Pierce and M. N. Sprouse. Others present included: J. W. Coan, E. H. Cole, D. R. Denton, H. L. Jones, M. S. Martin, J. A. McDonald, D. R. Patterson, R. A. Pedde, and R. W. Olson.

The task force appointed as a result of the February 18, 1983, policy committee meeting consists of Henry Jones, team leader; Ed Cole; Don Denton; John McDonald; and Bob Olson. The team has been in daily sessions since February 22, 1983.

Attachment 1 is a list of task force responsibilities. Attachment 2 is a flow chart that will be used in the evaluation of the Black and Veatch findings. Attachment 3 is an instruction keyed to the flow chart. The policy committee generally agreed with the course of action outlined in these three attachments.

The first two pages of Attachment 4 group the B&V finding 34 categories according to the nature and subject of the finding. The task force consolidated these into 20 categories that need further evaluation. Categories 1(1) and 1(2) need no further evaluation. Category 1(3) requires further review to determine whether a deviation exists. The evaluation is to consider the cause of the problem and determine if it is applicable to Watts Bar on systems other than auxiliary feedwater and to Sequoyah, Browns Ferry, and Bellefonte.

The third page of Attachment 4 is a preliminary assessment of the 21 categories. The fourth, fifth and sixth page of Attachment 4 is the evaluation form. The evaluation form will be completed on each of the 20 categories requiring evaluation. One form will be used on each category for Watts Bar unit 1, Sequoyah, Browns Ferry, Watts Bar unit 2 and Bellefonte. The task force will consider the units and plants in that order. However, if a category is found to be applicable to Sequoyah or Browns Ferry and is identified as having an immediate safety implication, it will be given first priority.



OEDC MO Files March 4, 1983

WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW POLICY COMMITTEE MEETING

The task force estimated they will complete the determination of applicability of each category to unit or plant by March 14. (Post Meeting Note: The task force's experience on completing applicability on Watts Bar unit 1 indicates that comprehensive review will extend the established completion date to March 22, 1983.)

The course of action outlined above received the concurrence of the policy committee. Chuck Bonine and Mac Sprouse agreed that once the task force determines that a category is applicable to a specific unit or plant, Henry Jones, as task force chairman, should forward the evaluation form directly to the appropriate EN DES or CONST branch or project with instructions and directions for completion of the evaluation and corrective action.

The program plan defined and implementation initiated will have to be very prompt if we are to have our overall plan formulated by the time the B&V report is issued at the end of March.

Henry Jones noted the task force will need assistance on the Browns Ferry and Bellefonte forms.

E. Gray Beasley

EGB:CLC

Attachments

cc (Attachments):

J. W. Anderson, M155G MIB-K

C. Bonine, E7B24 C-K

H. N. Culver, 249A HBB-K

G. H. Kimmons, Wl2A9 C-K

MEDS. W5B63 C-K R. M. Pierce, 104 ESTA-K

W. R. Brown, 102 ESTA-K - Please arrange for assistance to the task force for determining applicability to Bellefonte.

M. N. Sprouse, W11A9 C-K - George Hall is providing assistance to the task force for determining applicability to Browns Ferry.

ATTACHMENT 1

Establish a Task Force under the OEDC Policy Committee to perform the following functions:

- a. Recommend overall methodology for evaluating B&V findings
- b. Recommend assignment of organizations or individuals for performing each specific element of the evaluation process, considering itself, OEDC, other TVA and non-TVA organizations.
- c. Establish and maintain surveillance a... tracking over the implementation of the evaluation process.
- d. Designate and cause retention of appropriate records of the evaluation process.
- e. Factor the results of the response to B&V findings with other systemmatic efforts to prepare a basis for determining the overall adequacy and licensability of Watts Bar Nuclear Plant unit 1.
- f. Coordinate the utilization of B&V information generic to other TVA units.

E63059.06

Evaluate ongoing C/A

for future work

Determine C/A

for future work

Implement

C/A

Verify

Effect-

iveness

Evaluate ongoing C/A

for future work

E63054.03

Verify

Effect-

iveness

Implement

Determine C/A

for future work

ATTACHMENT 3

Instructions for Evaluating B&V Findings per Flow Chart

1. Evaluate all 428 B&V findings to determine whether a deviation existed with respect to either TVA's licensing or internal commitments for design, construction, or operation. (It is recognized that operations preparedness was not specifically reviewed; however, indicators of deviations with respect to these commitments must be evaluated.)

Designations used for findings when evaluation by Task Force determines that further review is not required will be:

- 1(1) TVA and B&V consider there to be no deviation.
- 1(2) B&V identified deviation from final design or construction requirements for which TVA has determined work to be incomplete. To be incomplete, the CONST accountability system and/or an OEDC deviation control system must have identified the remaining work prior to B&V identification.

Designation used when additional input is required:

1(3) - B&V findings which require further review to determine if deviation existed since OEDC disagrees with B&V conclusion. Upon completion of this review, all of these findings must be assigned to one of the categories.

- 2. Sort all remaining findings into generic and individual categories to streamline the evaluation process. B&V findings are generic at this point if the deviation is recurrent within the scope of the B&V review.
- Evaluate circumstances surrounding the deviation identified by each category to determine root cause(s) in management controls which allowed the deviation in the work activity. Also, evaluate root causes against those in other reviews (CAT, INPO, NSRS, etc.).
- 4. Based upon the root cause(s) identified in 3, select samples of work activities which were affected to review for generic deviations in work activities for WBN unit 1 outside the scope of the auxiliary feedwater system and determine potential effects on work activities for WBN unit 2, SQN, BFN, and BLN.
- 5. Evaluate the B&V identified findings and the generic examples identified in 4 to determine whether the identified finding(s) or root cause prevent the satisfaction of the licensing basis.
- 6A & 6B. Identification and evaluation of ongoing corrective action to correct identified findings and root causes for completed action.
- 7A & 7B. Identification of corrective action to correct identified findings and root causes for completed work.

8A & 8B. Self-explanatory.

9A & 9B. Identification and evaluation of ongoing corrective action
to correct identified findings and root causes for future
work.

10A & 10b. Identification of corrective action to correct identified findings and root causes for future work.

11A & 11B,

12A & 12B. Self-explanatory.

E63059.06

	ATTACHMENT 4
SOTES:	
1. Findi	nge which do not require evaluation for determination of corrective action.
	Findings for which B&V and TVA consider there to be no deviation. Information subsequently given by TVA resolved B&V finding (R) and represented a TVA position that no deviation existed with respect to licensing or internal counitments.
	Examples
	F134 - Lack of test data for Tlame test of cable. TVA subsequently provided BLV with existing cable flame test results.
	F302 - TPIPE computer program not described in FSAR. TVA subsequently provided B&V with existing licensing submittel letter to MRC.
1(2)	BSV identified deviation from linel design or construction requirements for which TVA has determined work to be incomplete. To be incomplete, the CONST accountability system and/or an OEDC deviation control system must have identified the remaining work prior to B&V
	Exemples
	F357 - Restraint modeled for rigid restraint in vertical direction while designed support restrains in axial/lateral directions. TVA response - Ongoing corrective action for this deviation was incomplete under ECN 3198 and ECN 2576.
	F700 - Hanger not installed. TVA response - Incomplete construction status was correctly reflected under accountability proram WBN QCI-
i(3)	ESV findings which require further review to determine whether a deviation existed. OEDC disagrees with B&V identification of a deviation. Upon completion of review, all these findings must be assigned to another appropriate category.
	Examples:
THE STREET SHARE WILLIAM STREET	F108 - Red indicating light for valve thermal overload bypass does not verify operation of relays R1 through R6. OEDC position - circuit design was reviewed by MRC and approved in SER.
	F137 - Trip setting for electrical breaker not in accordance with manufacturer's recommendation. OEDC position - settings are in accordance with manufacturer's recommendations.
2. This ca	tegory has been eliminated and all findings placed in other categories.
3. Logic/co	ontrol drawings do not agree with electrical drawings - NCR WBNSWP8267.
-> 4. Failure	to design/maintain design records as specifically described in FSAR-GEN(288213, GENNEB8301, GENCEB8215, WBNCEB8206.
5. Procurer	sent data sheets and action diagrams for PCVs, LCVs, and check valves specified less than design requirements - ECN 3511, WBNNEB8207.
5 6. Deviation	one in translating support computer analysis results to load tables and then to support deigns - WBNCEB8232, WBNCEB8233, WBNSWP8272,
7. Nonconfo 4535R (R	orming conditions of construction of previously inspected and accepted pipe supports - NCR 4454R (R1), NCR 4455R (R0), NCR 4486R (R0), NCR 4486R (R0), NCR 4481R (R0), NCR 4476R (R0), NCR 4486R (R0), NCR 4481R (R0), NCR 4476R (R0), NCR 4486R (R0), NCR 4481R (R0), NCR 4476R (R0), NCR 4486R (R0), NCR 4481R (R0), NCR 4481R (R0), NCR 4476R (R0), NCR 4486R (R0), NCR 4481R (R0), NCR 448
	m has been reassigned to Note 4.
2 9. Excessiv	e loads/eccentric load on embedments - MCR WBNCEB8203.

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WATTS BAR NUCLEAR PLANT UNIT 1 PRELIMINARY ASSESSMENT OF FINDINGS AND ROOT CAUSES

Category Number	Number Findings	Licensing Bases Satisfied	Relative Importance to Safety	Adequate Corrective Action in Place
1(1)	100	Yes	NA	NA.
1(2) 1(3)	155 21	Yes TBD	NA TBD	NA NA
3	25	TBD	. В	
4	11	TBD	В	
5	12	TBD	C	
6	16	TBD	A	
7	17	No	A	
9	8	TBD	C	Yes
11	2	TBD	TBD	
12	1	No	- A	
13	1	TBD	С	
14	22	No	A	
18	1	TBD	С	
19	2	No	A	Yes
20	, 5	No	A	
23	2	No	A	
25	. 1	TBD	С	
30	2	No	A	
31	2	TBD	С	
32	19	TBD	. В	
33	2	TBD	C _i	
34	1	TBD	С	

Summary:

- 255 findings not requiring further review
 21 findings that require further review
 152 findings requiring further review

Notes:

- 1. TBD to be determined
- Relative importance to safety base on informative evaluated to date with A being most important and C being least important.

E63017.02

eview of Black & Teatch Findings	E/	LACK & VEATCH ALUATION SHEET	· 克里斯洛尔尔森 艾里里里里里	
1. Task Force Category	for			
2. Task Force Category De	escription and	Related B&V Findings:		
3. Evaluation for Cause				
A. Preliminary				
B. Final				·
Resp. Org.	1 1	Task Force Concurre	nce	1 /
Resp. Org. 4. Evaluation for Gener		Task Force Concurre	nce	1 /
		Task Force Concurre	nce	/ /
4. Evaluation for General A. Preliminary B. Final		Task Force Concurre	nce	<u> </u>
4. Evaluation for Gener A. Preliminary		Task Force Concurre	nce	1 /

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1 1	Task Force Co	oncurrence		
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B Final		
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B. Final .		
	/ / Task Force Concurrence	
B. Final Resp. Org.	/ / Task Force Concurrence	
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Resp. Org. Identification and A. Preliminary	Evaluation of Ongoing Corrective Action for Co	ompleted Work
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Resp. Org. Identification and A. Preliminary	Evaluation of Ongoing Corrective Action for Co	ompleted Work
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7B.	Identification of Corrective Action for Completed Work	•
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88.	Implementation and Inspection of Corrective Action for Completed Work	
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	B. Final	
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TVA 64 (OS-9-65)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

OEDC MO Files

'830502 401

FROM

E. Gray Beasley, Assistant to the Manager of Engineering Design and

Construction, W12B21 C-K

DATE

[:] May 2, 1983

SUBJECT: WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW - POLICY COMMITTEE MEETING

NOTES

The Watts Bar Independent Review Policy Committee met on April 28, 1983. Members present were: J. W. Anderson, E. G. Beasley, C. Bonine, H. N. Culver, R. M. Pierce, and M. N. Sprouse. Other present included: R. W. Cantrell, H. L. Jones, R. A. Pedde, D. R. Patterson, J. A. Raulston, Ralph Shell and Tom Knight.

It was noted that the B&V report was received and distributed on April 20, 1983 by memorandum from G. H. Kimmons to Those listed (EDC 830420 401). The B&V executive summary and conclusions were discussed along with each of the 10 confirmed findings. The other items such as the open findings, the findings punchlist, and the documented review punchlist were discussed in general. It was agreed that each item would be separately addressed.

The status of the task force review was discussed. No changes in direction for the task force were made as a result of the receipt of the report.

Ralph Shell gave a brief history of past NRC handling of independent review reports. He noted that NRC will work directly with B&V and that we should anticipate NRC issuing a safety evaluation report (SER) on the independent review and that we should be prepared to respond should they issue the SER. It was agreed that Henry Jones and Ralph Shell would contact the B&V project manager and inform him that he should expect to be contacted direct from NRC.

E. Gray Beasley

EGB:WBW

cc: J. W. Anderson, M155G MIB-K

C. Bonine, E7B24 C-K

W. R. Brown, 102 ESTA-K

H. N. Culver, 249A HBB-K

H. J. Green, 1750 CST2-C

G. H. Kimmons, W12A9 C-K

L. M. Mills, 400 CST2-C

R. M. Pierce, 104 ESTA-K

M. N. Sprouse, W11A9 C-K

MEDS, W5B63 C-K



TVA 64 (05-9-65)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

то

OEDC Manager's Office Files

'830 802 401 DC

FROM

E. Gray Beasley, Assistant to the Manager of Engineering Design and

Construction, W12B21 C-K

DATE

: August 2, 1983

SUBJECT: WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW - POLICY COMMITTEE MEETING -

MEETING NOTES

Reference: H. L. Jones' memorandum to Those listed dated July 18, 1983 (NEB 830718 271)

The policy committee met July 28, 1983. The members present were: E. G. Beasley, H. N. Culver and R. M. Pierce. Others present included: R. W. Cantrell, H. L. Jones, D. R. Patterson, J. A. Raulston, J. E. Wilkins and J. R. Lyons. A copy of the agenda is attached.

It was announced that each of the 25 task force categories had been entered in TROI for Browns Ferry, Sequoyah, Watts Bar unit 1, Watts Bar unit 2 and Bellefonte Nuclear Plants and that actions had been entered in accordance with assignment and schedule set by the task force.

Table 1 of the reference is a summary of the 25 categories for Watts Bar unit 1. Table 1 shows 9 where the licensing basis is not satisfied and corrective action is not in place. Of these 9, one--category 23--has been evaluated and confirmed that the licensing basis has been met. On 4 of the 9--categories 4, 14, 20, and 35--the evaluation has confirmed the licensing basis has not been met. Corrective action is proceeding such that the licensing basis will be met consistent with unit 1 fuel loading.

On 4 of the 9--categories 3, 6, 30 and 37--the evaluation is continuing. Category 3 concerns a mismatch between logic and control diagrams and detailed electrical drawings. The evaluation of category 3 is of particular concern due to basic nature of the problem and the informal estimate that 90 man-months will be required to review and evaluate the Watts Bar 1 drawings.

Those present agreed that the licensing basis on all 25 categories must be satisified for Watts Bar unit 1 before the OEDC Manager certifies to the General Manager and Office of Power that unit 1 is ready for fuel loading and before we can ask NRC to write off on the B&V independent review. Evaluations must proceed on the schedule that has been set by the task force to not impact the Watts Bar unit 1 schedule.

It was further agreed that for category 3 on Watts Bar unit 1 we must proceed posthaste to evaluate the seriousness and importance of the mismatches between the drawings. It was agreed the Watts Bar design project should be instructed to evaluate the mismatches identified by B&V on the auxiliary feedwater system. Further, the Watts Bar design project should select three other process systems and proceed to identify the mismatches



OEDC Manager's Office Files August 2, 1983

WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW - POLICY COMMITTEE MEETING - MEETING NOTES

that may exist in those systems and to evaluate the seriousness and importance of each mismatch and of the aggregate. Of the three process systems, two should have the pre-op tests complete. If available, the evaluation for those two systems should list the mismatches identified by NUC PR in the pre-op and their other NUC PR involvements with the system. This evaluation is needed as soon as it can be done and should be completed no later than October 1, 1983.

Those present further agreed that the task force categories for all plants while not designated as nonconformances must be treated similar to non-conformances and violations with respect to the evaluation and where applicable the cause and action to prevent reoccurrence. The categories should be treated with the same seriousness and priority as 50.55e items and NCR violations as the independent review is a commitment to the NRC.

With respect to the "general observations" section of the reference, all five items were noted. It was agreed that items 1 and 2 would be referred to EN DES for their consideration along with the EN DES effort now underway on design control. The task force was requested to expand and clarify item 4 on efforts to identify generic applications and then bring the item back to the policy committee.

The reference included a list of "concerns outside the scope of the task force responsibility." All six items were noted by those present, and item 4 concerning verification of alternately analyzed pipe under 2-1/2" diameter was referred to EN DES to develop a position.

Items A and B of the attachment to the agenda were noted and it was agreed that the chairman of the policy committee would clarify the instructions to the task force relative to the task force role and responsibilities.

E. Gray Beasley

EGB:WBW

Attachment

cc (Attachment):

- J. W. Anderson, M155G MIB-K
- C. Bonine, E7B24 C-K
- W. R. Brown, 102 ESTA-K
- H. N. Culver, 249A HBB-K
- H. L. Jones, W10A17 C-K**
- G. H. Kimmons, W12A9 C-K
- R. M. Pierce, 104 ESTA-K
- M. N. Sprouse, W11A9 C-K*
- MEDS, W5B63 C-K

*See page 3.

**See page 3.

OEDC Manager's Office Files August 2, 1983

WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW - POLICY COMMITTEE MEETING - MEETING NOTES

- *(1) Please consider items 1 and 2 of the general observations in the reference in your work on design control process.
- (2) Please develop an OEDC position regarding additional verification of alternating analyzed pipe less than 2-1/2" in diameter (for item 4 of the concerns outside the scope of the task force responsibility in the reference).
- (3) Instruct the Watts Bar Design Project to expand the sample for category 3 and report the results back through the task force.
- **Please expand and clarify item 4 of the general observations in the reference.

AGENDA

BLACK & VEATCH POLICY COMMITTEE

12:30 p.m. - July 27, 1983 - W12A3 C-K

I	Task Force Categories on TROI	Beasley
II	Assessment of Finding Categories - Watts Bar Unit 1 Table 1 of reference*	Jones-Denton
III	General Observations of Task Force See V of reference*	Beasley-Jones- Denton
IV	Concerns of Task Force See VI of reference*	Beasley-Jones- Denton
V	Other Task Force Concerns See attached	Beasley

*Reference - H. L. Jones' memorandum to Those listed dated July 18, 1983 (NEB 830718 271)

Other items

VI

OBSERVATIONS

A. GENERAL STRUCTURE

Responsibility for the resolution of the issues raised by Black and Veatch does not clearly rest with cognizant organizations, the Task Force, or the Policy Committee. Authority to control the resolution does not clearly rest with the cognizant organizations, the Policy Committee, or individual committee members.

B. COGNIZANT ORGANIZATION EFFORTS

Inability of the cognizant organizations to direct adequate manpower resources from production-related activities to problem evaluation.

Evaluators do not adequately understand management controls in order to determine cause(s) so that generic examples and actions to prevent recurrence can be effectively identified.

Unwillingness to identify actions which would require additional resources in order to avoid an adverse impact on schedule.

Unwillingness to accept that current activities may be resulting in similar deviations.

TVA 64 (05-9-65)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

EDC '830815404

OEDC Manager's Office Files

FROM

E. Gray Beasley, Assistant to the Manager of Engineering Design and

Construction, W12B21 C-K DATE

August 15, 1983

SUBJECT:

WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW - POLICY COMMITTEE MEETING -

MEETING NOTES

Reference: My memorandum to Those listed dated August 5, 1983

(EDC 830805 401)

The policy committee met August 15, 1983. The members present were:

J. W. Anderson, E. G. Beasley, C. Bonine, H. N. Culver, R. M. Pierce and

M. N. Sprouse. Others present included: R. O. Barnett, R. W. Cantrell, F. W. Chandler, E. H. Cole, D. R. Denton, H. L. Jones, J. A. McDonald,

R. C. McKay, M. S. Martin, D. R. Patterson, R. A. Pedde, J. C. Standifer and D. W. Wilson.

Each category listed in the attachment to the reference was individually reviewed. There was agreement among those present that the licensing basis must be met prior to Watts Bar unit 1 fuel loading. The course of action and schedule outlined were considered to be adequate, with the exception that for category 30 some additional sampling may be necessary.

A copy of a proposed memorandum from E. G. Beasley to H. L. Jones outlining task force responsibilities was given to policy committee members. It was mutually agreed that the memorandum should be sent.

Category 3 which was the subject of the August 2, 1983, policy committee meeting was discussed. The Watts Bar project progress appears to be adequate.

EGB:WBW

cc: J. W. Anderson, M155G MIB-K

C. Bonine, E7B24 C-K

W. R. Brown, 102 ESTA-K

H. N. Culver, 249A HBB-K

H. L. Jones, W10A17 C-K

G. H. Kimmons, W12A9 C-K

R. M. Pierce, 104 ESTA-K

M. N. Sprouse, W11A9 C-K

MEDS, W5B63 C-K



UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

1831006 402

O : OEDC Manager's Office Files

FROM : E. Gray Beasley, Assistant to the Manager of Engineering Design and

Construction, W12B21 C-K

DATE : October 6, 1983

SUBJECT: WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW - POLICY COMMITTEE

MEETING - MEETING NOTES

References: 1. J. A. Raulston's memorandum to NEB Files dated September 29, 1983 (NEB 830929 265).

2. C. Bonine's memorandum to E. Gray Beasley dated August 16, 1983 (DOC 830816 001).

3. J. C. Standifer's memorandum to H. L. Jones dated September 29, 1983 (WBP 830929 024).

The policy committee met September 30, 1983. The members present were: J. W. Anderson, E. G. Beasley, C. Bonine, H. N. Culver. R. M. Pierce was represented by J. W. Coan; M. N. Sprouse was represented by R. W. Cantrell. Others present included: H. L. Jones, J. A. McDonald, D. R. Patterson and J. C. Standifer.

The recent meeting with NRC was discussed in detail (see reference 1 for background information). The proposed approach for resolution of the findings is to move all B&V findings into either resolved or confirmed status and then for those findings in the confirmed status to obtain B&V concurrence on corrective action. A proposed letter to Black & Veatch was presented, and it was generally agreed to send the letter. (NEB 831604 251)

Consistent with the last action item in reference 1, OEDC will work toward addressing the generic applicability of the B&V findings to other Watts Bar systems and to other TVA nuclear units. Work will proceed as in the past using the task force information to develop a succinct report addressing generic applicability to Watts Bar units 1 and 2. For those items the task force determines to be generic, the root causes implications and appropriate corrective action will be defined.

Both the specific resolution of the independent B&V findings and the generic applicability to Watts Bar 1 and 2 should be completed by mid-December such that the report can be made to NRC in early January.

The task force will continue to address the generic applicability to plants other than Watts Bar. This work should proceed at a pace such that we can respond to questions should they arise during the NRC presentation on Watts Bar.



OEDC Manager's Office Files October 6, 1983

WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW - POLICY COMMITTEE MEETING - MEETING NOTES

Reference 2 requested discussions on earlier task force recommendations. The three specific concerns in reference 2 were discussed in general. One concern in reference 2 dealt with the expansion of the 79-14 hanger inspection program alternately analyzed to pipe 2 inches and under. That task force recommendation had been referred to EN DES during the original discussion by the policy committee. The EN DES report is included as Attachment 1. The report agreed with the NRC portion to exclude small-diameter pipe from the 79-14 inspections. The general task force discussion agreed with this position.

In the July 18, 1983, policy committee meeting during discussion of task force category 3 the Watts Bar design project was requested to identify the mismatches between conceptual and detail drawings on three Watts Bar unit 1 systems. Reference 3 was the report on this study. Based on the study, J. C. Standifer recommended that no further action be taken due to the unimportance of the mismatches. Reference 3 and J. C. Standifer's recommendation were referred to the task force for a more detailed evaluation.

E. Gray Beasley

EGB:WBW

cc: J. W. Anderson, M155G MIB-K

C. Bonine, E7B24 C-K

W. R. Brown, 102 ESTA-K

H. N. Culver, 249A HBB-K

H. L. Jones, W10A17 C-K

G. H. Kimmons, W12A9 C-K

R. M. Pierce, 104 ESTA-K

M. N. Sprouse, W11A9 C-K

MEDS, W5B63 C-K

Engineering Design Position on the Exclusion of Small Diameter Alternate Analysis Piping from NRC OIE 79-14 Programs

This documents our past and future position related to the exclusion of alternately analyzed piping 2-1/2 inches and less in diameter from the NRC OIE Bulletin 79-14 programs at TVA. Bulletin 79-14 specifically excludes small diameter piping not qualified dynamically by computer and, after review by EN DES, we concurred with the NRC position. It should be noted that a significant amount of small diameter piping has been rigorously analyzed and, as such, was included in the 79-14 program. The remainder of the small diameter piping is qualified by a very conservative alternate analysis criteria.

Alternately analyzed piping is determined to be adequately supported for several reasons. Since the criteria was developed to support piping very conservatively in the rigid range of response, a greater degree of tolerance is permissible on pipe routing and support requirements. This conservatism has been repeatedly shown by rigorous analysis of previously alternately analyzed piping and, in most cases, 50 percent or more of the supports can be removed. Also, it is normally the case that small diameter alternately analyzed piping is less critical relative to safety concerns since high energy piping and class I piping greater than I inch in diameter requires rigorous analysis. Also, less energy is involved with the low mass small diameter piping and therefore less potential for damage exists. This type of piping is often field supported and is documented on a field generated isometric. In this case, the isometric is "as constructed" so that no discrepancies should exist between the piping and its corresponding isometric.

A vast majority of current 79-14 discrepancies are interferences. These are less significant for small diameter piping where less energy is available to create problems. Also, since the piping is supported rigidly, interferences tend to dampen seismic response and limit the energy level even further. Although troublesome, interference problems with small diameter piping do not usually create safety problems and are of limited importance due to the small displacements associated with a rigid support configuration. Another discrepancy has to do with support of concentrated weights such as valves. For alternately supported piping where the configuration is rigidly supported and extra supports at concentrated weights are often required by criteria (or at least specifically addressed by requiring reduced spans), inadequately supported concentrated weights are seldom a problem.

Therefore, our policy has been and is to exclude small diameter alternately analyzed piping from the NRC OIE Bulletin 79-14 programs at TVA.

In the future, less small diameter piping will be alternately analyzed due to the use of approaches such as the Computer Aided Piping Analysis and Support Design (CASD) system now being implemented. These rigorous analysis systems are being implemented to reduce the conservatism inherent in alternate criteria and for the resulting economic benefits. CASD analyzed piping will fall under the 79-14 program. However, our position is that our current 79-14 program goes beyond the requirements of the NRC Bulletin. In order to consider the large amount of small diameter piping, the TVA 79-14 "phase I" program would be limited to a visual inspection of piping configuration and support requirements. This type of program must be coupled with an augmented QA inspection program including the establishment of an interference control program to control this major source of discrepancies in order to reduce the results of the 79-14 program to a more manageable level. Assurance that the design basis and NRC requirements have been met will be obtained by an audit program similar to our current detailed 79-14 "phase II" walkdown of a limited sample of analyses.

TVA 64 (05-9-65)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

OEDC Manager's Office Files

'831207 403

FROM

E. Gray Beasley, Assistant to the Manager of Engineering Design and

Construction, W12B21 C-K DATE

December 7, 1983

SUBJECT: WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW - POLICY COMMITTEE MEETING - MEETING NOTES

> The Black and Veatch policy committee met on December 6, 1983. The members present were: J. W. Anderson, E. G. Beasley, C. Bonine, H. N. Culver, R. M. Pierce and M. N. Sprouse. Others present included: H. L. Jones, H. E. McConnell, D. R. Patterson and J. C. Standifer.

H. E. McConnell reported on the status of the corrective action on individual findings. All corrective action reports have been completed and the last seven are being transmitted to Black & Veatch by Federal Express. Most of the forms were transmitted to Black & Veatch by the November 22, 1983, deadline. Informal contacts between McConnell and Black & Veatch indicated that 45 of the corrective action reports have been approved and our coversheet is being returned to TVA. Twelve other finding corrective actions have been identified as having minor problems. McConnell is working direct with Zidziunas to resolve these minor items.

In the ensuing discussion, it was agreed that we should stick to our schedule and clean up the finding corrective action reports by January 2 and be prepared to meet with NRC by mid-January. McConnell will informally remind Black & Veatch of this schedule.

Henry Jones reported on the status of the task force activities. The status of each of the 25 task force categories for each of the plants is summarized in Attachment 1. It was mutually agreed that the task force efforts and the project and branch support on open categories should proceed posthaste toward resolutions so that we can adhere to our mid-December date for resolution of task force categories on Watts Bar units l and 2.

During October, memoranda were sent to NUC PR requesting allocation of funds to address the task force categories for Sequoyah and Watts Bar.

The task force had difficulty resolving four categories (one category on Bellefonte, one category on Sequoyah, and two on Watts Bar). The Bellefonte category concerned discrepancies between various levels of electrical drawings; this category has been resolved based on the



OEDC Manager's Office Files December 7, 1983

WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW - POLICY COMMITTEE MEETING - MEETING NOTES

corrective action on an earlier nonconformance report. The Sequoyah category dealt with the closing of a large ECN. The problem has been discussed with PWP and now appears that some additional work by PWP will resolve the issue.

It appears that one of the two Watts Bar categories has been resolved. The resolved category concerns surveillance testing capability of the motor-operated valve thermal overload bypasses. A position has been discussed with ESB and appears to be a logical resolution. The resolution is to work a DCR after fuel loading which will make the testability of the system fully meet regulatory requirements. In the interim until the DCR has been worked, the bypasses can be tested by two persons—one acutating a switch and the other observing relay mechanical motion.

The other problem category on Watts Bar concerns discrepancies between logic schematic wiring and connection diagrams. This was discussed in two earlier policy committee meetings. The task force is still looking at their position on these discrepancies. In addition I am not comfortable in that I feel that these types of discrepancies are highly undesirable and are not the type of work which TVA should be doing relative to nuclear work.

Four reports are planned to complete the independent review program. The first report will be the supplemental report prepared by Black and Veatch. This supplemental report will be transmitted direct to NRC. Black and Veatch has indicated the major element in this report will be the corrective action forms TVA has submitted to Black and Veatch on each finding that was confirmed, open or punchlisted. Black and Veatch has also stated that there will be a minimum of explanation of their review of the corrective action.

Depending upon the nature of the B&V supplemental report, TVA may need to develop a report responding to the specifics raised by B&V. If so, a separate report addressing these specifics will be prepared.

The task force is planning a comprehensive report on their work concerning the generic applicability of the findings to other than the Watts Bar unit lauxiliary feedwater system. The task force report will include information on the grouping of the findings, the breakdown of the categories, and will specifically address whether or not the licensing commitments have been met as well as the usual attributes of conditions adverse to quality, such as applicability to past work and corrective action to prevent recurrence.

OEDC Manager's Office Files December 7, 1983

WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW - POLICY COMMITTEE MEETING - MEETING NOTES

The fourth report will consist of the overview and actions of the policy committee. This report will in essence tie together all of the work and be one component of a certification package used for the overall certification that Watts Bar has been built in accordance with the licensing application. It is envisioned that the latter three reports will probably be letter reports from various persons with the policy committee report being a letter report to Mr. Kimmons.

E. Gray Beasley

EGB:WBW

Attachment

cc (Attachment):

J. W. Anderson, M155G MIB-K

C. Bonine, E7B24 C-K

W. R. Brown, 102 ESTA-K

H. N. Culver, 249A HBB-K

H. L. Jones, W10A17 C+K

G. H. Kimmons, W12A9 C-K

R. M. Pierce, 104 ESTA-K

M. N. Sprouse, W11A9 C-K

MEDS, W5B63 C-K

			Responsibility				
Plant	Number of Categories	Categories Closed	Task Force	Line Org.	NUC PR (Funds)	EGB	Being Typed & Signed
WBN 1	25	13	31	5 ²	13*	14	2
SQN	25	11			12	1	1
BFN	25	10			14		1
WBN 2	25	12	4	5	1	1	2
BLN	25	13	2	·8		1	1
Totals	125	59	9	18	28	4	7

^{1.} Categories 3, 19, 30

^{2.} Categories 5, 6, 11, 14, 32

^{3.} Category 37

^{4.} Category 38

^{*}related to preop test - not awaiting funds.

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

'840 9 2 5 2 0 2

Office of Engineering Files

E. Gray Beasley, Chief, Quality Management Staff, W12B23 C-K

DATE

September 24, 1984

SUBJECT: WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW POLICY COMMITTEE

Reference: Memorandum from G. H. Kimmons to Those listed dated October 7,

1982 (EDC 821007 005)

The Watts Bar Independent Review Policy Committee met on September 19, 1984. Members present were: C. Bonine, Jr., H. N. Culver, R. M. Pierce, R. W. Cantrell, and myself. Others present were H. L. Jones,

D. R. Patterson, and J. A. Raulston.

The task force evaluation for each category was a 12-step process. Step 12 was to determine the effectiveness of the corrective action for future work. In August 1983 the task force was directed to not complete step 12 due to lack of task force resources. Instead, the forms completed through step 11 were to be forwarded to OQA and OQA was to complete step 12 as part of their surveillance and audit program. In OQA the responsibility was assigned to the Quality Improvement Staff and subsequently reassigned to the Design Quality Assurance Branch. The reorganization resulted in the Design Quality Assurance Branch being transferred back into the Office of Engineering (OE). The OE Quality Management Staff has assumed the responsibility for closure of step 12. After step 11 is complete, the task force will forward the forms to QMS. QMS will complete step 12 and return the forms to the task force for closure.

During August 1984 Region II examined the management and quality controls related to the Black and Veatch independent review. The inspection report included one follow-up item (390/84-57-01). The follow-up item required TVA to formalize and develop a comprehensive plan for completion of items associated with the Black and Veatch study--that is, the closure of the task force evaluation forms. The follow-up item included evaluation for applicability of the categories to similar findings at other TVA nuclear plants. The plan for closure has been developed with closure to be complete on all Watts Bar categories by the end of November 1984. Region II has been so informed so they may complete their follow-up. With respect to applicability to other nuclear plants, the task force categories have been applied and work is progressing in that area. The actions taken and scheduled to be taken through November 1984 should enable complete closure of the Black and Veatch report on Watts Bar and closure of the Region II inspection follow-up item.



Office of Engineering Files September 24, 1984

WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW POLICY COMMITTEE

Task force category 30 for Bellefonte involves work that is not yet undertaken. In the past the task force was directed to close out findings and categories when the corrective action was in an ongoing tracking system. The commitment for Bellefonte task force category 30 is in the FSAR and is included in the regulatory guide commitment sheets. It is not in PC-III nor is it in the commitment tracking record maintained by NEB. The policy committee directed that a commitment tracking record be established to track Bellefonte task force category 30 to closure.

Black and Veatch finding 137 dealt with Electrical Design Standard E9.2.1 in that some designs had been accomplished prior to issuance of the design standard. The corrective action given to Black and Veatch and used in their acceptance of the corrective action for closure was that all systems would be brought into the requirements of Electrical Design Standard E9.2.1.

Subsequent to the approval by Black and Veatch, Electrical Design Standard E9.2.1 has been superseded by a design guide which relaxes the requirements in that the engineer has the option on whether or not to follow the guide. The corrective action to bring Watts Bar up to E9.2.1 has been completed. Primary concern was that we had changed the commitment that had been the basis for Black and Veatch concurrence on the corrective action. The policy committee agreed that the Black and Veatch Program Manager should call Black and Veatch, explain the situation, obtain Black and Veatch concurrence, then have Black and Veatch distribute their telephone note signifying agreement the same as they had distributed the initial report.

It was noted that Region II had made an inspection on civil and mechanical aspects of Black and Veatch. While several concerns were raised in the exit meeting, none specific to Black and Veatch as their concerns had been identified prior to the Black and Veatch review.

I had been informally notified that Leonard Blankner, a member of the task force, is transferring from OQA to Watts Bar site. It was agreed by the policy committee that the remaining members of the task force—namely Henry Jones, Don Denton, and Ed Cole—should complete the task force work without replacing Leonard.

Office of Engineering Files September 24, 1984

WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW POLICY COMMITTEE

In summary, all Black and Veatch findings, concerns, and task force concerns are scheduled and now on a routine closure. It was mutually agreed that further meetings of the policy committee would not be appropriate. If there are task force concerns or independent review concerns, they should be directed to the appropriate P&E Office Manager.

At the suggestion of R. M. Pierce, it was unanimously agreed that the task force has performed admirably under unusual and trying circumstances and for a sustained perid. The task force consolidated the numerous findings into definite categories and provided leadership and direction for each to be methodically and logically evaluated and assessed for other systems on Watts Bar and the other nuclear plants. The entire issue has been thoroughly evaluated and the TVA processes significantly improved through the diligent efforts of the task force.

E. Gray Beasley

EGB:NCH

cc: J. W. Anderson, 255 SPB-K

C. Bonine, Jr., E7B24 C-K

W. R. Brown, 102 ESTA-K

R. W. Cantrell, WllA9 C-K

H. N. Culver, 249A HBB-K

R. M. Hodges, 1117 IBM-K - Note CTR will be issued on BLN task force category 30.--EGB

H. L. Jones, W10D225C-K - Note actions to close forms in second paragraph.--EGB

R. M. Pierce, 104 ESTA-K

J. A. Raulston, W10C126 C-K - Please issue CTR for BLN task force category 30. Have B&V Program Manager work with B&V to document their concurrence on deletion of Electrical Design Standard E9.2.1.--EGB

```
9/24/84 - RWC:NCH
cc: MEDS, W5B63 C-K
J. P. Darling, 1750 CST2-C
H. G. Parris, 500A CST2-C
E. H. Cole, P-105 SB-K
D. R. Denton, W9D191 C-K
H. L. Jones, W10D225 C-K
J. A. McDonald, 345 SPB-K
R. C. McKay, Jr., Watts Bar CONST)
R. W. Olson, Sequoyah CONST
H24265.01
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7 V & 64 109-9-69-

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

GNC '840705 053

To

H. G. Parris, Manager of Power, 500A CS12-0

H. N. Culver, Director of Nuclear Safety Review Staff, 249A HBB-K

M6 34

FROM DATE

July 5, 1984

84071900661

SUBJECT:

NUCLEAR SAFETY REVIEW STAFF (NSRS) ASSESSMENT OF THE RESULTS OF THE BLACK AND VEATCH (BGV) INDECEMBENT DESIGN REVIEW OF THE WATTS BAR NUCLEAR PLINT (WBN) AUXILIARY FEEDWATER SYSTEM - NSRS REPORT NO. R-84-19-VBN

During various phases of the B&V review, the RSRS independently examined various activities so that it would be in a position to draw conclusions regarding both the adequacy of the work performed by B&V and the TVA line response to the findings and their subsequent actions.

From January through March 1984, NSRS had made sufficient evaluations to support the basic conclusions set forth in the Policy Committee report dated March 20, 1984. As a part of the detailed evaluation made by NSRS, a number of findings were identified that NSRS has examined in greater detail. These represent areas where NSRS considers further corrective action is required.

The attached report provides seven recommendations for follow-up action. Two of the recommendations relate to problems with the drawings at the plant. Recognizing the problems that you are presently finding in this area at BFN, we believe you will want to take corrective action at WBN to establish configuration control as soon as possible. It is our understanding that you are committed to expanding the BFN RPIP program to all of the TVA nuclear plants. We believe that if the same program actions you are taking at BFN are taken at WBN, the problems identified at WBN can be adequately addressed.

Within 30 days of receipt of this memorandum, please provide NSRS your plan of action to respond to the recommendations. Any questions concerning the report should be addressed to J. F. Murdock of my staff at extension 6620-K.

H. N. Culver

DES 184 0709 005

7/9/84 - MTG cc (Attachment):

L. J. Cooney, W6D224 C-K

J. C. Standifer, 204 GB-K

xe: MEDS, WSB63 C-K

JFM:HNC:LML Attachment cc (Attachment):

J. W. Anderson, 255\SPB-K

R. W. Cautrell, WIIA C-K J. P. Darling, 1750 CST2-C

R. M. Pierce, 104 ESTA-K W. F. Willis, E12B16 C-K

MEDS, WSB63 C-K



UNITED STATES GOVERNMENT

840710T0225 🗇



Memorandum

TENNESSEE VALLEY AUTHORITY

GNS '840705 053

H. G. Parris, Manager of Power, 500A CST2-C

FROM

H. N. Culver, Director of Nuclear Safety Review Staff, 249A HBB-K

DATE :

July 5, 1984

SUBJECT:

NUCLEAR SAFETY REVIEW STAFF (NSRS) ASSESSMENT OF THE RESULTS OF THE BLACK AND VEATCH (B&V) INDEPENDENT DESIGN REVIEW OF THE WATTS BAR NUCLEAR PLANT (WBN) AUXILIARY FEEDWATER SYSTEM - NSRS REPORT NO. R-84-19-WBN

During various phases of the B&V review, the NSRS independently examined various activities so that it would be in a position to draw conclusions regarding both the adequacy of the work performed by B&V and the TVA line response to the findings and their subsequent actions.

From January through March 1984, NSRS had made sufficient evaluations to support the basic conclusions set forth in the Policy Committee report dated March 20, 1984. As a part of the detailed evaluation made by NSRS, a number of findings were identified that NSRS has examined in greater detail. These represent areas where NSRS considers further corrective action is required.

The attached report provides seven recommendations for follow-up action. Two of the recommendations relate to problems with the drawings at the plant. Recognizing the problems that you are presently finding in this area at BFN, we believe you will want to take corrective action at WBN to establish configuration control as soon as possible. It is our understanding that you are committed to expanding the BFN RPIP program to all of the TVA nuclear plants. We believe that if the same program actions you are taking at BFN are taken at WBN, the problems identified at WBN can be adequately addressed.

Within 30 days of receipt of this memorandum, please provide NSRS your plan of action to respond to the recommendations. Any questions concerning the report should be addressed to J. F. Murdock of my staff at extension 6620-K.

> Driginal Signod By H. N. Culver

> > H. N. Culver

FM: HNC: LML Attachment

cc (Attachment):

J. W. Anderson, 255 SPB-K R. W. Cantrell, W11A9 C-K

J. P. Darling, 1750 CST2-C R. M. Pierce, 104 ESTA-K W. F. Willis, E12B16 C-K

HEDS WSB63 C-K



GNS '840705 054

TENNESSEE VALLEY AUTHORITY
NUCLEAR SAFETY REVIEW STAFF
NSRS REPORT NO. R-84-19-WBN

SUBJECT:

NSRS ASSESSMENT OF THE RESULTS OF THE BLACK AND VEATCH INDEPENDENT DESIGN REVIEW OF THE WATTS BAR NUCLEAR PLANT AUXILIARY FEEDWATER SYSTEM

DATES OF

REVIEW:

JANUARY 10 - JUNE 15, 1984

REVIEWERS:

TECHNICAL ANALYSIS AND REQUIREMENTS GROUP

APPROVED BY:

INTES F. MURDOCK

DATE DATE

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I. PURPOSE AND SCOPE

The NSRS performed an assessment of the results of the Black and Veatch (B&V) Independent Design Review of the Watts Bar Nuclear Plant Auxiliary Feedwater System to determine if we could support the policy committee report regarding the B&V review and to document areas where NSRS considered additional action was needed. The adequacy of the immediate corrective actions and the degree of "lessons learned" to other Watts Bar plant features and to the TVA nuclear program in general were assessed.

.

The Black and Veatch initial and supplemental reports, the activities of the TVA program team and cognizant line organizations, the activities of the TVA management policy committee and its report, the activities of the policy committee task force and its report, discussions with the TVA line engineers and managers, and onsite verification form the scope and basis of the NSRS assessment. Since the full applicability of the Black and Veatch findings to all the TVA nuclear facilities has not been determined by TVA, NSRS will perform followup assessments where appropriate.

II. EXECUTIVE SUMMARY

From January through June 1984, the NSRS performed a review and analysis of the results of the Black and Veatch (B&V) Independent Design Review of the Watts Bar Nuclear Plant (WBN) Unit 1 Auxiliary Feedwater (AFW) System and the TVA activities in response to the B&V findings. The NSRS review covered the B&V initial and supplemental reports, the activities of the TVA program team and the cognizant line organizations, the activities of the TVA management policy committee, and the activities of the task force of the policy committee.

The impetus of the NSRS effort was to assess:

- the quinty and appropriateness of the B&V review and the selection of the AFW system as the representative system;
- the technical adequacy and consistency of the TVA responses to the individual B&V findings;
- the determination of causes and generic applicability of findings and categories of findings to other WBN unit 1 systems and to other TVA plants; and
- the analyses and evaluations performed to determine the safety implications of the findings or categories of findings had the B&V activity not taken place.

The following conclusions were reached from the NSRS assessments;

- 1. The AFW system was a good choice for a multidiscipline representative review. The B&V review was generally complete in depth and technically competent. A weakness in the B&V review was the lack of detailed examination of the consequences of findings by onsite verification. Since the B&V review was based upon the FSAR of record in 1982 and further design changes or FSAR amendments have been and will be implemented, the degree of conformance with current regulatory positions could not be determined. This could lead to continuing direction from NRC as the plant begins operation, particularly from the I&E Office.
- 2. For the greater part, NSRS agrees with the resolution of specific findings. The notable exceptions are in the electrical discipline (cable tray fill and treatment of protective devices) and in the structural discipline (embediments and attendent attachments) Followup discussion with EN DES, both in Knoxville and at the site, have led to resolution of the NSRS concerns in the structural area assuming the current (post-B&V study) EN DES practices are formalized in the proper procedures. In addition to the specific technical disagreements, NSRS found the definition of the safety impacts of the findings to be inconsistent with the basic engineering and safety reasons for having the features in place. A second weakness was that the record of resolution of the findings was not uniformly and completely documented.
- 3. NSRS substantially agrees with the task force grouping of findings into categories by way of determination of causes and the determination of generic applicability. In some cases more than one root cause could have been assigned a finding. Thus, the judgement of the reviewer as to the more important factors could be questioned; however, these differences are considered of low consequence.
- The identification and correction of deviations or questionable conditions is a very important result of an effort such as the B&V review. Since a perfect plant or system is not likely to be found, the determination of the effect on the plant performance had the deficiencies not been discovered is deemed the most value able aspect of the B&V review program implemented by TVA. The NSRS assessments support the conclusions of the policy committee that there is no direct indication that any affected structure, system, or component would not have performed its safety function. The safety evaluations performed by EN DES also support the conclusion that the safety functions would be performed. However, it is the assessment of NSRS that some of the identified deficiencies could lead to indeterminant conditions or conditions adverse to quality and to safety which reduce the margin of safety. Further actions were and are required to assure the margin of safety committed in the FSAR are met.

Additional observations drawn from the results of the B&W review are:

- Considering the degree of completion of Watts Bar unit 1, the number of deviations found by B&V which would probably not have been discovered otherwise was fairly high. This underscores the value of independent design reviews by parties outside the TVA system. The findings would have been much easier to correct or avoid had the review been conducted earlier in the design/construction process. For lessons learned value, the Bellefonte project should consider this assurance tool.
- The nature of the deviations indicates a need to substantially upgrade the configuration management processes and personnel training programs in TVA.

III. RECOMMENDATIONS

A. R-84-19-WBN-1 (Category 3)

All controlled documents should be clearly identified for all plants. The purposes and uses for each of the documents should be delineated. Information contained in documents designated to be controlled should be assessed for contribution to the intended purpose and use. Superfluous information should be deleted and discrepancies in documents with overlapping information should be corrected. Establishing a verified "as built," rigorously documented, should be assigned a very high priority.

B. R-84-19-WBN-2 (Category 9)

Procedure EN DES EP4.03 should be revised as has been verbally committed to reflect that visual examinations supported by field calculations are the basis for documenting acceptability of changes to or additional attachments to embedded plates in the field.

C. R-84-19-WBN-3 (Cagegory 9)

Consideration should be given to additional sampling for multiple attachments to imbedded plates made prior to February 1983 or an evaluation of the consequences of failure of 1 to 15 percent of the supports in view of the overstressed anchor in one of the 69 plates already sampled.

D. R-84-19-WBN-4 (Category 20)

The methods and procedures for determining the proper values, physically setting, and verifying time delay relays settings should be reevaluated and indicated changes should be expeditiously made TVA-wide.

E. R-84-19-WBN-5 (Category 34)

See recommendation for Category 3.

F. R-84-19-WBN-6 (Category 35)

The instantaneous trip breakers should be verified to be set in agreement with the intent of the National Electric Code. The documentation for the design as well as for the testing and operations of the equipment should reflect the proper values. The program should be implemented TVA wide.

G. R-84-19-WBN-7 (Category 36)

Criteria should be developed for field use to control actual cable tray fill levels and to provide a basis for QC inspection. A feedback system should be included from the construction forces pulling cable to the designers routing cable to avoid the overfill problems to date. Although the problems at WBN 1 may be beyond fixing in many instances, expeditious action should be taken to upgrade the system for WBN 2 and Bellefonte.

IV. DETAILS

A. Background

From September 1982 through February 1984, an independent review of the Watts Bar Nuclear Plant (WBN) auxiliary feedwater system was performed by Black and Veatch (B&V) to determine the conformance of the system to commitments docketed in the FSAR. A TVA program team provided responses and additional information to the B&V reviewers to resolve questions and define corrective actions for confirmed deviations.

In a separate activity, a policy committee and a task force, both composed of senior TVA staff, evaluated the B&V findings for significance to other WBN unit 1 and 2 systems. The findings were evaluated for root cause and sorted into groups of similar nature. Where deemed appropriate, safety evaluations were performed to determine the consequences to the plant had the B&V review not been performed and the deviations gone undetected.

The B&V review findings were published initially in April 1983 and supplemented in February 1984. The results of the TVA task force efforts are documented in their March 1984 report to the policy committee chairman. The policy committee efforts are documented in their summary report to the EN DES Nuclear Engineering Branch.

The NSRS was involved throughout the process by being represented on the policy committee, by participating in the continuing reviews of the B&V findings and the TVA responses and by performing evaluations of the task force activities and report. The task force grouped the B&V findings into categories by determin-

ing the causes and generic applicability. The NSRS has evaluated each of these categories and basically agrees with the groupings of the findings. In the following section the NSRS evaluation of the categories is discussed. Any recommended follow-up action resulting from these evaluations is set forth in section III.

B. Discussion

General Observations

From an overall perspective, the B&V review showed that TVA did an acceptable design job in meeting the first order design requirements. Although there were a number of instances where the licensing commitments and licensing bases were not satisfied, further evaluations showed no cases where the ability to safely shutdown the plant was defeated. The deficiencies for the most part were failures to provide the additional margins of assurance committed in the FSAR. The basic causes for deficiencies involved lack of or poor training, failure to follow procedures, poor understanding of the commitments and lack of clear procedural definitions of commitments. In some instances the commitments were not rigorously met because they were viewed as enhancements as opposed to firm requirements.

Safety evaluations were performed by EN DES of the categories of findings where the licensing bases were not met. In all cases it was found that the ability to shutdown the plant had been maintained. The impacts of the reduced margin on overall plant safety and the effects of failure to implement the criteria for protective devices for plant equipment were not assessed.

2. Task Force Category 3

Category 3 contained 25 B&V findings where logic/control drawings did not agree with the electrical drawings. The identified cause for the category was failure to implement design review procedures as required by engineering procedure EP 4.25. The task force concluded the problems were generic to logic, control, schematic and connection diagrams throughout WBN units 1 and 2. The review was extended to three additional systems where similar problems were found. It was determined that corrective action was required for both past and future work.

The line organization has issued ECNs and FCRs to correct identified errors in hardware wiring and training was conducted in the I&C section of Sequoyah/Watts Bar Project (SWP) for EP 4.25. The drawings will be stamped to restrict the use to the intended function. No further reviews of other systems is planned to determine if other systems have

the same problems, in spite of the widespread problems identified in the four systems that were reviewed. These problems included instances where as many as 13 wires shown on one drawing were installed on the wrong terminals (FCR E-3508, system EA). Finding F805 identified a crosstic between normal and emergency 125 V dc systems. Schematic 45W603-46-6R4 was different in many significant respects from logic diagram 47W611-3-4R2.

NSRS agrees with the TVA line actions to the point of correcting known wiring errors. We do not agree that their corrective action for past and future work is adequate. Since the problems have been demonstrated to be common in the four systems reviewed, it is reasonable to assume the deficiencies are institutional and all the plant systems should be reviewed and deficiencies corrected. Further to knowingly allow discrepancies to continue to exist in overlapping documents and depend upon a note to control document usage is very poor practice. Although the precise reason for the wiring errors cannot be ascertained, having conflicting information on overlapping documents cannot be helpful in precluding such errors. Further, during operations, personnel such as ROs, SROs, maintenance engineers and crafts rely upon such drawings as logic diagrams and schematics to perform their jobs. Allowing discrepant information on any controlled document places too great a burden on the administrative control systems to preclude use for a wrong purpose and further errors attendent to this practice can be expected including further wiring errors and misoperating equipment. The correct way of handling drawing errors is specified in EP 1.26 "Nonconformances Reporting and Handling by EN DES." It may be necessary to have more training in procedures at the management levels since these actions are being prescribed by management. NSRS recommends that all controlled documents should be clearly identified for all plants. The purposes and uses for each of the documents should be delineated. Information contained in the documents designated to be controlled should be assessed for contribution to the intended purpose and use. Superfluous information should be deleted and discrepancies in documents with overlapping information should be corrected. Establishing a verified "as built," rigorously documented, should be assigned a very high priority.

3. Category 4

Category 4 contained 12 B&V findings which the task force described as failure to design/maintain design records for the AFW system as specifically described in the FSAR. The task force identified cause was that TVA personnel were not aware of the FSAR statements. When the design changed, the FSAR was not uniformly amended to reflect the new designs. The problem was deemed generic to both WBN units and required corrective action for past and future work.

A special engineering procedure (SEP 83-05) was written to verify the accuracy of the WBN FSAR. Additionally, EP 2.01 was revised (revision 5) to upgrade the procedure for processing FSAR changes and EP 4.02 has been revised to require that engineering change notices (ECNs) describe FSAR changes needed as a result of the design change. NSRS reviewed the SEP to assess its completeness. Little guidance is offered to the reviewers of the FSAR as to the depth or method of review. Further the B&V review found deficiencies in the TVA response to IE Circular 81-13 and IE Bulletin 80-20. The SEP 83-05 review was restricted to FSAR sections; questions, responses to IE bulletins, NRC generic letters, etc., were not included in the review. The SEP review may not have corrected the deficiencies in the remaining commitments.

NSRS reviewed a sample of the proposed FSAR revisions and found a number of inconsistencies. The problem was discussed with OQA; a program was instituted by OQA to address the NSRS concerns.

4. Task Force Category 5

Category 5 had 10 findings where procurement forms and flow diagrams specified different requirements for various valves and qualification documentation was not tied to the design and procurement process. The task force concluded this category required corrective action for future work and for past work as appropriate.

The underlying problem for this cateogry was a breakdown in the ECN process. Although some of the problems were attributed to the inappropriate use of S1 ECNs, some breakdown in the ECN, squadchecking, and signature process occurred. Although the task force identified two EPs being changed or issued, the procedures in place at the time that these problems developed were adequate if rigorously implemented. The NSRS agrees with the TVA and task force actions for this category.

5. Task Force Cagegory 6

Category 6 contains 7 findings of discrepancies between documents (analysis results, load tables, isometric drawings, flow diagrams, etc.) used in the design of piping systems. The task force found this category required corrective action for both past and future work.

The NSRS agrees in general with the TVA and task force conclusions for this category. But even though individual areas of the design may indeed have random and unique errors, an overview of these areas indicates a generic problem of implementation of procedures, attention to detail and lack of a really independent review process.

7. Task Force Category 7

Category 7 has 17 findings of nonconforming conditions in construction of previously inspected and accepted pipe supports. This set of findings required some modification to future activities; other TVA actions in place prior to the B&V findings are expected to resolve any deficiencies in completed work.

All of these items were due to the pipe supports in the field being different from what was shown on the drawings. In many cases there were ECNs and FCRs pending when B&V did their study. This resulted in drawings being different than field conditions because CONST had not made the modifications yet. Also, the NRC Bulletin 79-14 program, "walkdown," under WBN-QCP-4.56 had not been implemented when B&V did their study. The discrepancies probably would have been been corrected by the 79-14 program. There is no safety concern after implementation of the 79-14 program, and correction of any deficiencies found, which is required prior to unit fuel loading. The pipe supports would have been inspected, and the ones with problems would have been corrected.

7. Task Force Category 9

Category 9 has 8 findings of failure to adequately control and evaluate embedded plate capacity when multiple attachments were made to the plate by construction. The task force concluded that corrective actions already identified and scheduled would have resolved the deficiencies and that some modification to planned corrective action for future work is needed.

NSRS substantially agrees with the task force and EN DES responses and actions for this category except in the area of embedded strip plates.

The initial NSRS review and discussions with cognizant EN DES designers concluded the findings relative to the strip plates would not have been corrected by actions already identified nor would the deficiencies have been corrected by the corrective action plan identified. There is no control system to identify and maintain records of as built loads on the plates. With this lack of record or system, there is no way of knowing whether plates are overloaded.

NSRS has two points in question on this subject which lead to a direct safety concern:

 Although it was not discussed by B&V, the embedded plates have been analyzed with a "rigid" plate analysis as opposed to a "flexible" plate analysis. This can be an unconservative analysis. Of 69 cases that were checked, an anchor on one plate was shown to be stressed beyond the allowable stress in the acceptance criteria and a stiffener was added as in documented in the corrective action NCR WBN-CEB-82-02. This is a generic issue since all plates are analyzed in the same manner. It should be recognized that NRC has not fully accepted the TVA assumptions in response to IE Bulletin 79-02.

Of much greater concern is the control of attachments to embedded plates. There is no bookkeeping system to keep track of the cumulative load on any individual Construction Specification N3C-928 embedded plate. was implemented in February 1983 in response to the B&V findings to restrict locations of attachments. However, there was still no system established to identify and control the cumulative load on each plate. This specification should have been more restrictive. On January 6, 1984 revision 2 of N3C928 was issued which allowed the EN DES representative onsite "by visual examination" to determine whether a detailed evaluation of the plate is required. The representative has no guidelines or acceptance criteria, but uses engineering judgement. NSRS has serious concerns with this reduction in requirements. Black & Veatch had signed off on this finding on December 30, 1983 on the basis of the February 1983 revision of N3C-928. TVA relaxed the requirements in the specification seven days later. The only way to ensure that plates do not fail is to do an analysis using the actual loads or to compare the actual loads to the loads used in the prior analysis and show that the revised loads are within the envelop of the analyzed case.

Based upon the second concern, NSRS visited WBN to review the visual examination process. The EN DES representatives were actually checking loads against the allowables, not just visually examining; however, the results were not being documented. After the NSRS visit, OQA issued deviation report CO3-S-84-0089-DO1 and EN DES designers have agreed verbally with NSRS and in response to OQA for the deviation to revise Appendix 4 to EN DES EP 4.03 to document the field calculations as the basis of approval. This would eliminate our concern on the cumulative loads for attachments made under N3C-928.

NSRS has a residual concern for all the multiple attachments made prior to February 1983. The sampling of 69 plates revealed one plate with an overstressed anchor requiring a stiffener. The EN DES cognizant designers should consider taking a larger sample to gain greater confidence that all the plates are adequate. If the additional sampling is not

done, consideration should be given to performing a safety evaluation of the supported members with a basis of 1 to 1½ percent support failures since 1 in 69 of the embedded plates sampled had an overstress condition when compared to the allowable.

8. Task Force Category 11

Category 11 has 2 findings of inadquate documentation of operational modes data used in the analyses of piping systems. These findings were classified as deviations from the licensing commitments and bases and required corrective action for both past and future work.

A sampling program of rigorously analyzed piping was instituted to provide assurance that no design problems remained. Initially 20 problems were evaluated and none required reanalysis. The sample problems represent approximate: 10 percent of the total number of rigorously analyzed problems. Another 30 percent have been updated for other reasons and the proper operational mode data were included.

NSRS agrees with the TVA actions and conclusions for this category.

9. Task Force Category 12

Category 12 had one finding of failure by EN DES and CONST to properly implement and document the alternate analysis criteria for seismically supported piping. It was concluded that although there was a deviation from a licensing commitment, actions already being taken by TVA would have corrected the problem without reliance on the B&V study.

NSRS agrees with the TVA actions defined in EN DES SEP 8218 and SWP EP 43.21 dealing with alternate analysis problems and the task force conclusions.

10. Task Force Category 13

Category 13 had one finding in which termination information on documentation was in error and was not updated to reflect the actual configuration. The task force review concluded based on a sampling of 40 additional AFW termination records with no discrepancies that this finding was an isolated case and no further action is required.

NSRS supports this conclusion.

11. Task Force Category 14

Category 14 had 22 findings where various supports on the AFW system had not been modified, redesigned, or initially designed per revised analysis of ECN 2576. The task force concluded the findings were departures from licensing commitments and licensing bases. Corrective action was designated for both past and future work. The EN DES evaluation of the overallimplications of the discrepancies revealed that the problem was substantially isolated to the one ECN. A total of 5500 supports were reviewed--5000 in ECN 2576 and about 500 in ECN 3184 to support the conclusion. Although about 8 percent of the supports covered by ECN 2576 required some construction modification, only one support covered by ECN 3184 required construction modification which very strongly supports the conclusion that ECN 2576 was an isolated occurence albeit over an extended period of time.

An evaluation of the support deficiencies showed that the reserve stress in the pipe was not exceeded such that even through a support may have failed, the riping would not be overstressed. NSRS fully agrees with the task force and EN DES conclusions and corrective actions for this category.

12. Task Force Category 18

Category 18 had one finding where a technical note on a piping support drawing was found to be invalid for some applications. It was concluded that the finding condition was a deviation from a licensing commitment but the licensing basis was met. There was corrective action for future work; no modifications to existing support bolting was required.

NSRS agrees with the task force and EN DES evaluations and corrective action for this category.

13. Task Force Category 19

Category 19 had two findings where equipment could not be determined to be environmentally qualified to NUREGO588. These findings represented deviations from the licensing commitment; TVA already had a program in place which could have reasonably been expected to correct the problems.

NSRS agrees with the TVA conclusions for this category.

14. Task Force Category 20

Category 20 had five findings where, as stated by the task force, no procedure existed for documenting preoperational

testing determined time delay relay settings and the preoperational test scoping document did not identify or require documenting the settings. The task force classified the findings as deviations from the licensing commitments but the safety consequences were indeterminate. The task force documentation indicates the settings made prior to June 1983 were documented adequately by an interim memorandum (EEB 830614 439). The preoperation test scoping document and EN DES procedure SEP 83-11 have been written to require documentation of all the settings determined after June 1983.

The NSRS evaluations of this problem showed the scope to be greater than the task force addressed in this category since there appears to have been no effective control over time delay relays. Corrective actions for significant NCRs for these findings included procurement of new time delay relays to provide an adequate range. The existing relays would not allow setting the time called for on logic diagrams, hence the logic had not been properly implemented. This may be related to the lack of procedures governing logic diagrams (Category 3). The extent of the generic applicability review for this category is not clear to NSRS. The methods and procedures for determining the proper values, physically setting, and verifying time delay relay settings should be reevaluated and indicated changes should be expeditiously made TVA-wide.

15. Task Force Category 23

Category 23 has two findings related to the AFW turbine pump trip and throttle valve not being included on the active valve list and the valve schematic nct including the required control room bypass and test indication nor automatic bypass of the open torque switch. It was concluded the discrepancies were deviations from both the licensing commitments and bases. Corrective action was required for past and future work. The evaluation for cause concluded the deficiency was an isolated error resulting from failure to include the valve on the active valve list. Including the valve on the active valve list. Including the valve on the active valve list, providing the automatic torque switch bypass and providing the control room indication of bypass and test of the thermal overload correct the deficiency and the licensing requirements are met. The EN DES safety evaluation concluded the nuclear safety of the plant would not have been reduced if the deficiency had not been corrected.

NSRS agrees the corrective action taken is acceptable and the requirements are satisfied.

16. Task Force Category 25

Category 25 has one finding of flange evaluations being omitted in some analysis calculations. The task force concluded that the licensing commitment had not been met but evaluation showed the licensing basis was met. The corrective action included a 100 percent review of all completed calculations to assure flange qualification. Since the deficiency was attributed to individual errors, the corrective action for future work is to more clearly define the requirements.

NSRS agrees with the EN DES corrective actions and conclusions.

17. Task Force Category 30

Category 30 has two findings of failure to satisfy design criteria for (1) menitoring operability and (2) providing adequate electrical protective devices for the motor-driven AFW pump lube oil pump. The task force concluded the licensing commitment and the licensing basis were not met. The evaluation for causes revealed inadequate training and poor or lack of communications with NUC PR and EN DES. In reviewing other equipment, only one additional instance of failure to provide electrical protection was found. Thus the deficiency was not widespread. The EN DES safety evaluation of the two findings concluded there would be no safety concern had the defects not been corrected.

NSRS agrees with the specific corrective actions for the identified problems for this category.

18. Task Force Category 31

Category 31 has two findings of editorial discrepancies in licensing documents. The findings did not represent compromises of the licensing basis. The low number of errors found in this category support the conclusion that no action beyond correcting the identified errors is warranted, particularly in light of the extensive efforts detailed in Category 4.

NSRS agrees with the task force conclusions for this category.

19. Task Force Category 32

Category 32 has nine findings of incompatible hanger drawings and piping isometrics. The errors were deemed to be caused by checking and design verification of documentation between branches not being done as required by procedures.

The corrective action was to train designers in the procedural requirements. The errors did not result in any identified safety concerns since much of the work was not complete and system walkdowns could be expected to identify any incorrectly placed or installed supports.

NSRS has one residual concern with the EN DES corrective action. Since the root cause was inadequate training in procedure requirements, a continuing or periodic training program would appear to be needed. One time training is not felt to be totally adequate. Further, the corrective action was through SWP-AI1 R2, which appears to apply only to the Sequoyah/Watts Bar design projects not to TVA design projects in general.

20. Task Force Category 33

Category 33 has two findings of inadequate cable tagging. The two cited instances were the result of an oversight in one case (correct information, wrong color tag) and information being obscured on the tag due to wear and tear from rework in the other. No corrective action for past or future work was indicated since the frequency of occurence was low and walkthroughs are already designed to find and correct errors of this type. No safety concerns were expressed.

NSRS agrees with the task force conclusions for this category.

21. Task Force Category 34

Category 34 has 11 findings where "out of function" features of drawings were not in agreement with the latest design drawings showing the detailed design of the "out of function" features. The task force concluded that the "out of function" features do not impact the technical adequacy of drawings and are not used for design, construction or operation of the plant. No corrective action was deemed necessary.

NSRS agrees with the technical impact conclusions reached by the task force; our recommendation for Category 3 is equally valid for this category.

22. Task Force Category 35

Category 35 has one finding where instantaneous trip settings for motor-operated valve breakers were not in accordance with EN DES criteria and vendor recommendations. The task force concluded the licensing commitment and the licensing basis were not met and corrective action was required for both past and future work. The EN DES safety evaluation concluded:

While these high settings were found to violate good design practice and could lead to a motor control center failure, the high trip settings would not prevent the safe operation or the safe shutdown of the plant.

The basic cause of the deficiencies was lack of training and knowledge of changed requirements and expedient decisions not to correct deficiencies when the requirements were known not to have been met.

NSRS has substantial concerns with the EN DES and task force resolution of this finding category. First, the safety evaluation tabulates 444 breakers out of 610 having settings greater than 1300 percent of the motor full load current. Of the 444 breakers, 385 were either reset or replaced and set. The remaining 59 breakers were neither replaced nor reset and are still apparently not in compliance with the commitment to the requirements of TVA Design Standard E.9.2.1 (now superceded by a non-mandatory Design Guide E2.3.5, issued November 10, 1983) which references requirements of the National Electric Code (NEC). No justification was or has been documented for not resetting or replacing the 59 breakers. This misapplication of the NEC requirements as implemented by Design Standard 9.2.1 leaves TVA in noncompliance with the practices of industry as reflected in the NEC for motor circuit protection. This in turn places WBN in noncompliance with the FSAR commitment although the FSAR does not directly commit to the NEC, the Design Standard clearly does and the Design Standard has not been met in all cases.

A second and higher level concern is the failure of the cognizant EN DES personnel to properly consider applicable parts of the NEC. The EN DES safety evaluation very selectively quotes section 430-52 of the NEC by quoting an exception ". . . the setting of instantaneous trip circuit breakers shall in no case exceed 1300 percent of the motor full load current." Other parts of section 430-52 which are equally applicable state: "The motor branch circuit short circuit and ground fault protective device shall be capable of carrying the starting current of the motor. A protective device having a rating or setting not exceeding the value calculated according to the values given in Table 430-152 shall be permitted." The maximum allowed setting in Table 430-152 is 700 percent of the full load current of the motor. The full wording of the exception quoted in the safety evaluation is "Where the setting specified in Table 430-152 is not sufficient for the starting curren' of the motor, the setting of an instantaneous trip circuit breaker shall be permitted to be increased but shall in no case exceed 1300 percent of the motor full load current.

The expressed EN DES electrical design practice and philosophy are not in concert with present day nuclear design logic or common industrial practice. By NSRS reading, the stated EN DES positions do some injustice to the reasons for having protective devices of any sort. Clearly protective devices should be set as closely to normal operating conditions as possible while recognizing the full range of conditions including starting loads and avoiding nuisance trips. The NEC specifies this clear philosophy by using words such as "not exceeding" and "maximum" throughout. Table 430-152 of the NEC specifies 1300 percent to be the maximum exception. The NEC does not specify that all the breakers should or can be set at 700 percent or 1300 percent or any other given value.

The EN DES safety evaluation is incomplete in that the consequences of the pervasive nature of the deficiencies was not thoroughly considered. A worst case consequence was proposed which could lead to a fire which could disable a complete motor control center. It was further stated that the scenario, while possible, is so improbable as to be considered incredible. NSRS is concerned that broad conclusions have been reached with so narrow failure analysis and consequences determination being documented. The misapplication of the breakers exposes equipment to unnecessary challenge. These challenges can cause undetected failures which would not be seen during periodic testing. At the best, the deviations would have reduced safety margins even though single failure criteria may have been met; therefore, the deviations were significant to safety.

The instantaneous trip breakers should be verified to be set in agreement with the intent of the National Electric Code. The documentation for the design as well as for the testing and operations of the equipment should reflect the proper values. The program should be implemented TVA wide.

23. Task Force Category 36

Category 36 has one finding that the cable tray fill criteria are not assured of being met because of the less than conservative nominal values used for cable cross sectional areas in the cable routing program. After evaluation by designers, it was concluded that the licensing requirements had been met and no corrective actions are required for either past or future work.

NSRS does not agree that the licensing commitment has been met; it is not clear that the licensing basis has

been met. The WBN FSAR states that ". . .low-voltage power cable tray fill shall be limited to a maximum of 30 percent of the cross-sectional area of the tray, except when a single layer of cable is used. Cable tray fill for control and instrumentation cables shall be limited to a maximum fill of 60 percent of the cross-sectional area of the tray." The supporting EN DES documentation for the conclusion that the licensing requirements had been met was based upon considerations of dead weight, ampacity and heating value of combustibles in isulation and jacket materials. While NSRS agrees these are important considerations, there are others such as mechanical protection of the cables from missles or casual hazards.

The FSAR describes a fully automated computerized system to route cables and to control cable fill using the criteria stated above. There is not a variable to control for cables of the same guage but different diameter; there is no formal feedback procedure to alert the designer, when for vagaries of construction, that the tray is full physically before all the cables are installed as computer routed. Further, no acceptance criteria have been provided for either the installer or a QC inspector to use to consistently determine that a tray is physically full.

Although not a part of the findings in task force Category 36 additional conditions adverse to quality noted by NSRS during a field trip to WBN to observe the cables in cable trays were:

- Excess cable coiled and hanging from edges of cable trays.
- Excess cable coiled and lying on the floor where people have to walk to access areas of the plant.
- 3. No record of megger test results for cables.

EN DES should develop acceptance criteria to be used by construction forces as well as the QC inspectors which define fill in measurable terms to supplement the arithmetical computer methodology. The additional problems above must be resolved. Until these deficiencies are corrected, TVA can not adequately justify that the licensing requirements are satisfied in full. NSRS believes safety evaluations should be made of the conditions described prior to substantial plant operation.

24. Task Force Category 37

Category 37 has one finding where valve wiring circuits were designed such that the red and green indicating lights on the unit control board would light dimly upon malfunction of the PAuto contact of the Westinghouse W2 control switch on the unit control board. It was concluded the design did not satisfy either the licensing commitment or basis and corrective actions were taken. EN DES recognized the requirement; however, the failure was a random design error in conjunction with inadequate design verification. The circuits with W2 switches were reviewed and the deficiencies were corrected when found.

NSRS agrees with the EN DES corrective action taken.

25. Task Force Category 38

Category 38 has two findings of failure of the thermal overload bypass circuit designs to meet the requirements of RG 1.106 and IEEE 279-1971. The task force concluded the licensing basis had been met and no corrective action was required.

NSRS agrees with the EN DES and task force resolution for this category.

26. Task Force Category 39

Category 39 has one finding where the specific configuration of 6.9kV bundled cables in trays had not been tested for the effects of fire retardant coating on the ampacity of the cable. The task force concluded the licensing commitment had not been met but the basis had been satisfied. An evaluation of the condition was prepared as part of the policy committee activity and was presented to NRC for acceptance.

NSRS agrees with the conclusions and actions taken by EN DES and the task force for this category.

TVA 46 (05-0-45)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

GNS '840906 101

R. M. Pierce, OEDC Project Manager (Watts Bar), 104 ESTA-K

: H. N. Culver, Director of Nuclear Safety Review Staff, 249A HBB-K

DATE : September 5, 1984

840911H0049 @

SUBJECT: WATTS BAR NUCLEAR PLANT - NSRS ROUTINE REVIEW OF THE RESPONSE TO NSRS REPORT R-84-19-WBN, ASSESSMENT OF THE RESULTS OF THE B&V INDEPENDENT DESIGN REVIEW OF THE WBN AUXILIARY FEEDWATER SYSTEM - NSRS REPORT NO. R-84-26-WBN

> Attached is the NSRS report for the routine review of the response to NSRS report R-84-19-WBN. The purpose of this review was to examine the response provided in a memorandum from H. G. Parris to me dated July 31, 1984 (EDC 840801 601).

> Of the seven recommendations, NSRS considers four of the items satisfied. It is noted that while the action taken to resolve item R-84-19-WBN-01 was considered appropriate for WBN, the item addressed all TVA plants. This was not understood by your organization and the response only addressed WBN. It is understood that all of the TVA plants are reviewing the item for generic implications and responses are expected.

> NSRS does not concur with the response provided for recommendations R-84-19-WBN-06 and -07. As a result, the NSRS has recommended what action is considered to be necessary to satisfy the initial recommendation. This should be sufficient for the staffs to reach agreement on a specific course of action.

> Within 30 days of receipt of this report, please provide us with the proposed corrective action including the expected implementation date for the three open items.

> > H. N. Culver

Attachment

cc (Attachment):

C. Bonine, W7B24 C-K

R. W. Cantrell, W11A9 C-K J. P. Darling, 1750 CST2-C

MEDS, W5B63 C-K

H. G. Parris, 500A CST2-C

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

TENNESSEE VALLEY AUTHORITY

NUCLEAR SAFETY REVIEW STAFF

REVIEW

NSRS REPORT NO. R-84-26-WBN

SUBJECT:

NSRS ROUTINE REVIEW OF THE RESPONSE TO NSRS RECOMMENDATIONS IDENTIFIED IN NSRS REPORT

NO. R-84-19-WBN

DATES OF

REVIEW:

AUGUST 15-27, 1984

REVIEWERS:

John W. Machburn

9-5-84 DATE

J. D. SMITH

P. R. WASHER

BOB Jock

9-5-84 DATE

APPROVED

FOR J. F. MURDOCK

9-5-84-DATE

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B. <u>R-84-19-WBN-02</u> (Category 9)

This item is satisfied since NSRS concurs with the action specified in the memorandum mentioned above (EDC 840801 601).

C. <u>R-84-19-WBN-03</u> (Category 9)

This item is satisfied since NSRS concurs with the action specified in the memorandum mentioned above (EDC 840801 601).

D. R-84-19-WBN-04 (Category 20)

This item is satisfied. The NSRS recommendation that a review of time-delay relay settings procedures should be determined for all plants has been satisfied in large measure by work done under SEP-83-11 and work reflected in the memorandum from F. W. Chandler to H. L. Jones (EEB 831125 436). These documents provide satisfactory evidence for WBN and BLN time-delay settings. NSRS has reviewed the BLN design approach in which critical control functions are handled by solid-state logic (SSCS) with predetermined settings in all instances by the designers, and conclude that the program problems discovered by B&V on WBN do not apply to BLN.

E. R-84-19-WBN-05 (Category 34)

This item is satisfied. This category contained II findings where "out of function" features of drawings were in error (i.e. these drawings were not used to construct the feature, and drawings which were used differed because of changes or updating). Given the increased emphasis on training and the guidance by checklists and greater detail given in the EPs (EP 3.10 and EP 4.01 for example) now, there is no reason to believe that "out-of-function" features will be in error in the future to the degree that B&V found. In light of this information, NSRS does not believe there is a problem with "out-of-function" elements with the possible exception of old drawings which have not been through a change cycle recently. As noted by EN DES following their review of B&V findings, there were no significant user problems due to the errors found so far, so a special program to review all drawings for this type of error is probably not justified. No corrective action is necessary.

F. R-84-19-WBN-06 (Category 35)

This item is considered to remain open since the response presented in the memorandum from H. G. Parris to H. N. Culver dated July 31, 1984 (EDC 840801 601) and memorandum from J. C. Standifer to R. A. Coster dated July 18, 1984 (WBP 840718 076) is considered to be insufficient. The basic NSRS concern is that the 480-volt motor branch protection is not being performed in accordance with the National Electric Code (NEC). The response verifies this and is unacceptable for the following reasons.

 The memorandum from J. C. Standifer (WBP 840718 076) states in part:

Subsequent to the evaluation of the Task Force Category 35 finding, Design Standard DSE9.2.1 was replaced by DGE-2.3.5. This occurred on November 10, 1983, and negates the requirement to comply with the National Electrical Code. Design Guide DGE-2.3.5 references the National Electrical Code but the final decision in complying with the National Electrical Code is left up to the discretion of the designer per the definition of design guides.

NSRS considers it to be inappropriate to change a design standard to a design guide to resolve the conflict and leave the compliance to the discretion of the designer. The NEC, as with all nationally recognized codes and standards, represents the collective body of knowledge, experience and accepted design practice of the industry. Considering the safety significance of the application it is not considered to be appropriate to let designer discretion be the final authority.

2. The design guide does not appropriately implement the NEC requirements for instantaneous trip circuit breaker settings. Table 430-152 of the NEC states that the maximum rating or setting for instantaneous trip breakers for motors (other than dc constant voltage) shall be 700 percent of full-load current. An exception being that:

Where the setting specified in Table 430-152 is not sufficient for the starting current of the motor, the setting of an instantaneous trip circuit breaker shall be permitted to be increased but shall in no case exceed 1300 percent of the motor full-load current.

As stated, the 1300 percent setting can be used only if the setting is not sufficient for the starting current of the motor. The TVA Design Guide DG-E2.3.5, Table 1 recommends 7 to 13 times motor full-load current and to follow manufacturer's recommendations. The guide is not in compliance with the NEC since no mention is made on designing to the 700 percent and by exception permit settings up to 1300 percent of full-load current.

The TVA design guide DG-E2.3.5 states in part:

Table 1 (end of text) does not include overload protection, which must be selected in accordance with NEC Article 430, Part C (see section 1.2). Table 1 is based on the requirements of NEC table 430-152 (see section 1.3) and motor data included

in NEC table 430-150 for three-phase induction motors, full voltage starting, and motors with NEMA code letters F through V, or without code letter. The table shows maximum values, but does not include allowances for exception of NEC section 430-52 which, when required, should be used with discretion. The fuse ratings in the table are based on fuse manufacturers' recommendations corresponding to the foregoing code requirements.

Contrary to the statement of not including allowances for exceptions, the table permits the use of the NEC 1300 percent of full load currents as standard design guidance.

Based upon the above discussion, NSRS does not agree that this recommendation is satisfied until the following is completed:

- Design Guide DG-E2.3.5 is made a mandatory Design Standard.
- The Design Standard invokes the instantaneous trip circuit breaker setting requirements of the NEC from Table 430-152 and properly implements the exception clause.

G. R-84-19-WBN-07 (Category 36)

The item is considered to remain open since the response presented in the memorandum from H. G. Parris to H. N. Culver dated July 31, 1984 (EDC 840801 601) is considered to be insufficient.

Our root concern as raised in R-84-19-WBN, section IV.B.23, and as summarized in the recommendation section, III.G, was that there did not appear to exist criteria that could be used by the field personnel to evaluate the adequacy of the work that was being performed or that could be used by the QC inspection units to determine that the final installation was acceptable. This concern, which is stated in R-84-19-WBN, relates to the fact that TVA in its FSAR committed that:

. . . low voltage power cable tray fill shall be limited to a maximum of 30 percent of the cross-sectional area of the tray, except when a single layer of cable is used. Cable tray fill for control and instrumentation cables shall be limited to a maximum fill of 60 percent of the cross-sectional area of the tray.

It was recognized by NSRS that TVA uses a computerized system to route cables and to limit the fill in the cable trays. Although this system is used to assist and to document what was actually accomplished in the field, the computer system cannot be used as a final acceptance vehicle without some verification of what exists in the field.

The response to R-84-19-WBN-07 presented by the line organization relates to a concern that is not even identified by NSRS in its report. The recommendation made by NSRS relates to establishing design criteria and providing the field with the acceptance criteria both for installation and QC inspection.

As has been stated previously, the concern raised regarding the cable routing system was raised when NSRS observed that cabling in many areas exceeds the height of the side rails of the cable trays, even though the tray proper seems (in most cases) to have sufficient area to lay cable below the side rails. This physical condition at the plant also negates the natural protection the cable receives from the side rails, thereby unnecessarily exposing them to damage. NSRS recognized that the NEC did not specify tray fill criteria until 1975. However, our discussions with peers in the industry (Bechtel, Stone and Webster, Sargent and Lundy) revealed that tray fill was generally 1 ed to 80 percent and in no case were cables allowed to protrude above the side rail, the exception being where a "side board" could be added to accommodate a tray cover. Since we are not using "side boards" and covers for the Watts Bar trays, it would appear that our cabling in many areas is unnecessarily exposed to damage and is not consistent with standard industry practice.

TVA has recognized this inconsistency and has revised the TVA General Construction Specification G-38, section 3.2.1.3, paragraph b, which states in part:

Beginning with Bellefonte Nuclear Power Plant, cable trays must not be filled above the side rails except at intersections and where cables enter or exit the tray.

To satisfy the recommendation NSRS considers the following should be performed:

- a. Develop criteria for field use to control <u>actual</u> tray fill levels and to provide a basis for QC inspection.
- b. Either QC or the appropriate QA organization should through an inspection and/or audit process determine if the existing installation meets the established criteria.
- c. Where deviation from the FSAR commitment are made, TVA should perform a safety analysis to justify the deviations. Such deviations should be examined for reportability to NRC.

IV. PERSONNEL CONTACTED

Jim Thompson - Watts Bar Project Manager's Office Ara Djirikian - Electrical Engineering Branch 36 769

V. DOCUMENTS REVIEWED

EN DES EP 3.10

EN DES SEP 83-11

EN DES EP 4.01

ECN 4666

ECN 4667

EN DES EP 1.44

Drawings changed by ECN 4666 and ECN 4667

Memorandum from F. W. Chandler to H. L. Jones dated November 25, 1983 (EEB 831125 936)

Memorandum from H. G. Parris to H. N. Culver dated July 31, 1984 (EDC 840801 601)

Memorandum from J. C. Standifer to R. A. Costner dated July 18, 1984 (WBP 840718 076)

INPO Good Practices (Searched--none apply to "out-of-function" drawing)

EN DES DG-E2.3.5

National Electric Code, 1984

108 848781 016 EDC '84 0801 601

W. M. Culver, Director of Muclear Safety Review Staff, 249A FEB-K

H. G. Parris, Manager of Power, 500A CSTO-C

JUL 3 1 1984

84081000072

MUCLEAR CAPETY REVIEW STAFF (MSRC) ASSESSMENT OF THE RESULTS OF THE BLACK AND VEATCH (EAV) INDEPENDENT DESIGN REVIEW OF THE WATTS BAR MUCLEAR PLANT (LEN) AUXILIARY FEEDWATER SYSTEM - MSRS REPORT NO. R-84-19-VEN (REF: MEMO, HMC TO HCP, 7/5/84) (CNS 840705 853)

The purpose of this memorandum is to provide you with our response to the recommendations in the subject report. The attachment provides the specific details in response to your recommendations.

Our response provides you with some details wrich apparently were not provided to you during your review. These details have already been presented to your staff in a meeting on July 25, 1924. We believe that these additional details will alleviate the concerns of your staff. Additionally, we have confidence in our deviation control/corrective action system, such that those items which have previously been identified and which are in the process of being corrected should not be considered open concerns of the MCRS.

We believe this response and the consistents accountely address the concerns of your staff, and all findings can be closed. Any questions concerning this response chould be addressed to J. A. Thompson of the Project Lanager's organization (UPN) at extension 148-324-K.

RMP:JAT:JARF Attachment

de (Attachment):

ARMS, 640 CST2-C

J. W. Anderson, 255 SPE-K

C. Ponine, Jr., E7824 C-K P. W. Cantrell, W11A9 C-K

J. P. Darling, 1750 CST2-C

1900, YUS63 C-K

P. F. Patterson, W12A7 C-K

R. M. Pierce, 104 FOTA-K

DES 34 0801 015

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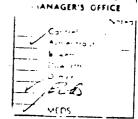
- (Attachment):

L. J. Cooney, W6D224 C-K

J. C. Standifer, 20% CB-K

: MEDS, W5B63 C-K

AUG 1 16A



RESPONSE TO NSRS RECOMMENDATIONS REPORT NO. R-84-19-WBN

R-84-19-WBN-1 (category 3) and R-84-19-WBN-5 (category 34) -- These two recommendations will be combined in one response.

Concern: Superfluous and discrepant information is known to exist on drawings with no planned corrective action.

Response: We agree that this condition exists; however, we do not agree that the condition has a detrimental effect on quality. As part of the response to the Black and Veatch findings, a study was conducted of the problem areas (electrical and instrumentation) to determine the effect of discrepant information on the actual work being performed. It was determined that the users of the design information were in fact utilizing the drawings with the correct information. The only exception to this conclusion was the use of logic drawings. EN DES has completed corrective action by reviewing all logic drawings to remove discrepant information; this was documented on ECN 4666, which is closed.

We are confident that our design review process has improved due to management emphasis and training on the requirements of EP 3.10 and 4.01, such that present and future work will not contain the same problems identified by this concern. We also believe that the corrective action for past work constitutes appropriate corrective action for the achievement of quality.

R-84-19-WBN-2 (category 9)

Concern: EN DES personnel at the site are not documenting their field calculations which support the visual examinations of attachments to embedded plates.

Response: We agree with your concern, and EN DES is in the process of correcting this problem. We do not believe that this problem should be tracked as an open NSRS concern, since we have the item tracked in our own deviation control/corrective action system through the Office of Quality Assurance deviation report No. C03-S-84-0089-D01.

R-84-19-WBN-3 (category 9)

Concern: The corrective action on one plate from the sample of 69 plates would indicate a 1- to 1-1/2-percent failure rate, which is not acceptable.

Response: We do not agree with your concern for the following reasons:

- 1. The sample of embedded plates was not a random sample. The sample was selected by EN DES personnel, using engineering judgment to visually examine and select the embedded plates with the highest loading in predetermined areas of high-loading potential. This type of sampling process provides a much higher degree of confidence in the statistical analysis.
- 2. The one plate--which had a stiffner added--was analyzed to have a stress of .96 yield, which is above the design limit of .9 yield. Although the stress was a failure to meet design limits, it was not considered to be a failure in material yield. This entire evaluation was documented on an EN DES Nonconformance Report No. WBNCEB8203, which was reported to the NRC as a 50.55(e), and has been reviewed and closed by the NRC.

Based on the above reasons, we have a very high degree of confidence that the attachments to embedded plates made prior to February 1983 are acceptable.

R-84-19-WBN-4 (category 20)

Concern: The problems encountered with time delay relay settings at WBN should be expeditiously evaluated for needed changes at the Bellefonte Nuclear Plant (BLN).

Response: We do not agree with your concern. The problems at WBN were evaluated for BLN as part of the Black and Veatch generic review, and it was determined that BLN did not have the same problem. This is documented in a response to the Task Force from the Electrical Engineering Branch dated November 25, 1983 (EEB831125936).

R-84-19-WBN-6 (category 35)

Concern: Fifty-nine breakers are in noncompliance with the intent of the National Electric Code, with no documented justification; and a nonmandatory design guide now supersedes the previous mandatory design standard.

Response: We agree with your concern. The planned corrective action for the 59 breakers--which was to be implemented in response to the Black & Veatch finding--was not being implemented. This was identified and reported to EN DES by OQA (OQA840504508, dated May 4, 1984). EN DES is in the process of correcting the situation and has responded to OQA (WBP840718076, dated July 18, 1984). We do not believe this concern should be tracked as an open NSRS item, since we already have the problem identified in our deviations control/corrective action system.

R-84-19-WBN-7 (category 36)

Concern: No documentation exists to verify that cable tray fill levels

are not exceeded.

Response: We do not agree with your concern on cable tray fill documenta-

tion. The documentation of cable tray fill exists in the fully automated computerized system to route the cables. The program is a living document which will be used for the life of the plant. Documentation via a computer printout is available at any time for any node point on any cable tray. We do not believe that is practical nor possible for a QC inspector to verify and document cable tray fill. Our computer system is controlled by WBP-EP-43-13. We have submitted a change to the FSAR (amendment 52) to explain the use of nominal cable diameters in our cable tray fill calculations. We believe no further action is required in this area. Additionally, the Office of Quality Assurance has scheduled a verification activity for this process, which will be conducted during the fourth quarter

of their verification schedule.

TVA 44 (05-8-49)

UNITED STATES GOVERNMENT

Memorandum

840713T0362

TENNESSEE VALLEY AUTHORITY

84 0710 601 FDC

TO

Those listed

FROM

R. M. Pierce, Project Manager, Watts Bar Nuclear Plant, 104 ESTA-K

July 10, 1984

SUBJECT: WATTS BAR NUCLEAR PLANT - NUCLEAR SAFETY REVIEW STAFF REPORT NO. R-84-19-WBN - ASSESSMENT OF THE BLACK AND VEATCH INDEPENDENT DESIGN REVIEW

> The purpose of this memorandum is to inform you that my organization will be preparing the response to the subject NSRS report. James A. Thompson, 106 ESTA-K (extension 324), will be coordinating this response.

Please assign an individual within your organization to handle the preparation of responses for your areas of responsibility, and inform me of the name of the individual assigned by July 16, 1984.

Your expeditious cooperation in this effort will be required in order to respond to the Nuclear Safety Review Staff by August 6, 1984.

C. Bonine, Jr., E7B24 C-K R. W. Cantrell, W11A9 C-K J. P. Darling, 1750 CST2-C

JAT:BH

cc: J. W. Anderson, 255 SPB-K H. N. Culver, 249A HBB-K MEDS, W5B63 C-K



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, united states government Memorandum

840731T0180

TENNESSEE VALLEY AUTHORITY

10

H. G. Parris, Manager of Power, 500A CST2-C

EDC '84 0730 701

Literate

W. R. Brown, Project Manager, Bellefonte Nuclear Plant, 102 ESTA-K

DATE

72 32 1984

SUBJECT: RELLEFONTE NUCLEAR PLANT - NEED FOR INDEPENDENT DESIGN REVIEW

References: (1) H. N. Culver to H. G. Parris memo dated July 5, 1984,
NUCLEAR SAFETY REVIEW STAFF (NSRS) ASSESSMENT OF THE
RESULTS OF THE BLACK AND VEATCH (B&V) INDEPENDENT
DESIGN REVIEW OF THE WATTS BAR NUCLEAR PLANT (WBN)
AUXILIARY FEEDWATER SYSTEM - NSRS REPORT NO. R-84-19-WBN

(GHS 840705 053/A02 840709 007)

(2) Telephone message from General Manager's Office to C. F. McBride's office regarding Board member comment on reference 1 (A47 840713 010)

Per your request of July 17, 1984, I have reviewed the reference 1 memorandum and attached report in light of the Board member comment and submit the following comments and conclusion regarding further reviews of the Bellefonte project.

- 1. In 1982 after NRC Chairman Palladino's address to the AIF meeting in San Francisco regarding the need and responsibility for the utilities to clean up their act and begin to police themselves, there were two main utility responses to this charge. Near-term operating license applicants would opt for the independent design review, such as the B&V review of Watts Bar, and those not so near term would subscribe to and embrace the Institute of Nuclear Power Operations (INPO) program for independent reviews.
- In harmony with no. 1 above, OEDC management made a conscious decision to execute the independent design review for Watts Bar and to utilize the INPO program for BLN.
- 3. The independent review conducted by B&V on Watts Bar consisted of a vertical slice of design and construction activities. The review was conducted on a selected system to provide a comprehensive assessment of TVA's design and construction activities at Watts Bar and to provide additional confidence to TVA and others in the adequacy of the plant. This vertical slice confirmation of the adequacy of the selected system coupled with broader, more comprehensive programmatic reviews (e.g., NSRS reviews) was to provide TVA with additional confirmation that Watts Bar was, in fact, designed and constructed adequately even though deficiencies in the QA program have been identified and resolved.

This independent review was executed on Watts Bar and the generic findings and any other important or significant findings were evaluated by the Bellefonte project and corrective actions initiated and implemented. This effort was accomplished under the oversight of the TVA B&V Review Task Force.

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H. G. Parris

BELLEFONTE NUCLEAR PLANT - NEED FOR INDEPENDENT DESIGN REVIEW

- 4. A self-initiated evaluation (SIE) of the Bellefonte design and construction program was conducted in the fall of 1982. The performance objectives and criteria developed by INPO were used for evaluation of the design and construction programs. The evaluation was performed by a team of senior technical and management personnel from Duke Power Company and TVA with INPO observers. The evaluation of the design and construction programs primarily concentrated on those areas for which TVA engineering and design organizations had direct responsibility and concentrated on the activities being performed at the construction site. The evaluation covered: (1) the design controls established by TVA for specifying design requirements, (2) the implementation of those controls by the engineering organizations, (3) the programs and policies at the construction site which ensure design requirements are fulfilled and (4) the performance of activities at the construction site which ensure that a quality end product is achieved.
- 5. Also in the fall of 1982 the Bellefonte project was subjected to an indepth evaluation by the NRC Construction Appraisal Team (CAT). This team consisted of senior NRC personnel from their central staff supplemented by Regional office personnel and consultants in specialty areas. The objective of this evaluation was to evaluate the adequacy of construction, the quality assurance program, material traceability, and procurement for the Bellefonte project. Within the areas examined, the review consisted of detailed examination of selected hardware subsequent to final TVA quality control inspections, a selective examination of procedures and representative records, observation of in-process work and interviews with management, inspectors, and craft personnel. For each area inspected, the following was determined:
 - a. Is the hardware/product fabricated/installed as designed?
 - b. Do individuals who have been assigned responsibilities in a specific area understand their responsibilities?
 - c. Are quality verifications performed during the process with applicable hold points and conducted to adequate inspection/acceptance criteria?
 - d. Do personnel involved with Quality Assurance/Quality Control have the organizational freedom to perform their tasks without harassment or intimidation?
 - e. Are management controls established and implemented to control activities in each area?
- 6. INPO conducted an evaluation of the Bellefonte project in early 1984. This evaluation team consisted of permanent INPO personnel and utility loanees. Their objective was to evaluate the control of design and construction processes and to identify areas needing improvement. The team examined organization and administration, design control, construction control, project support, training, quality and test control. Actual work and test performance are observed. A portion of the evaluation focused on a detailed examination of several stages of a

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H. G. Parris JUL 30 1984

BELLEFONTE MUCLEAR PLANT - NEED FOR INDEPENDENT DESIGN REVIEW

single process (a vertical look at design control and implementation) plus a review of several similar activities at one stage of the process (a horizontal look).

- 7. There is a very distinct possibility that BLN will be subjected to a NRC Design Appraisal Team Review (DAT) between now and fuel loading. This review basically performs the same type review performed by B&V.
- 8. There will be at least two more INPO evaluations of the Bellefonte project prior to fuel load of unit 1. Through personal observation of and conversation with Zack Pate regarding the improved quality and thoroughness of the design portion of the INPO evaluation, these should be sufficient to ferret out any design problems that we may have.
- 9. Per conversation with Cantrell and Dilworth, it is the intention of Engineering to perform inhouse reviews of the horizontal and vertical type to assess the design process. This was a recommendation of David Smith (INPO) to G. Dilworth in a recent meeting at INPO headquarters. Engineering will utilize personnel who have been loanees to INPO to lead these efforts. It is INPO's opinion that a proper mix of inhouse trained and directed personnel can more efficiently and effectively perform this type of review than can an outside firm.

I have discussed with Cantrell, Dilworth, and Beasley (Engineering), Culver (NSRS), Zack Pate (INPO), and Dave Verili (NRC Region II) the merits of performing the independent design review at an earlier timeframe in the design/construction process. In light of this, we have considered our existing commitments for future reviews and evaluations and our actions taken at Bellefonte in response to the B&V review, CAT appraisal, and INPO evaluations. Based on these discussions and considerations, we believe the Bellefonte project will have been subjected to substantially more comprehensive and independent review than that performed at Watts Bar as a near-term operating plant. Consequently, I will not recommend the use of an additional independent design review for Bellefonte.

cc: C. Bonine, Jr., E7B24 C-K R. W. Cantrell, W11A9 C-K

H. N. Culver, 249A HBB-K

J. P. Darling, 546 CST2-C MEDS, W5B63 C-K

D. R. Patterson, W12A7 C-K

U64205.01

WRB:MS

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

BFP '84 0921 019

: E. G. Beasley, Chief, Quality Management Staff, W12B21 C-K

FROM

: N. R. Beasley, Project Manager, Browns Ferry Engineering Project, 6204 MIB-K DATE : SEP 21 1984

SUBJECT: BROWNS FERRY NUCLEAR PLANT - BLACK AND VEATCH FINDING R-84-19-WBN-01 (TASK

FORCE CATEGORY 3)

84092710067 1

Reference: Your endorsement to me dated September 12, 1984 (QMS 840912 201)

The status and plan for category three, logic/control drawings do not agree with electrical wiring drawings, is given below:

1. Evaluation

Review of EECW electrical drawings (as a sample) revealed discrepancies among the logic/control drawings and the wiring drawings. The discrepancies found indicate documentation only changes are required for all systems. The wiring drawings were used in construction and modifications, thereby assuring proper plant configuration. However, both plant and design personnel presently use both control/logic and wiring drawings for determining system operation; and therefore, the drawings should be made to agree. No plant modifications are expected.

2. Recommendation

Perform a dedicated review of all systems (approximately 75) and correct any discrepancies between drawings. Discrepancies on current and future work are being corrected as they are identified.

3. <u>Plan</u>

Scoping and a cost estimate to perform a dedicated review of these systems will begin on September 24, 1984. Six weeks will be required to complete this estimate. Additional authorization from NUC PR will then be required to perform the review.

HLF:TR

cc: D. B. Bowen, W11A8 C-K

F. W. Chandler, W8C126 C-K

J. A. Raulston, W10C126 C-K

MEDS, W5B63 C-K

Principally Prepared By: H. L. Fields, Extension 3248

P24265.02

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Memorandum

TENNESSEE VAILEY AUTHORITY OMS '8409 28 20 1

TO

H. N. Culver, Director of Nuclear Safety Review Staff, 249A HBB-K

FROM

R. W. Cantrell, Manager of Engineering, W11A9 C-K

DATE

OCT 1 1984

84100470282

2

SUBJECT

BROWNS FERRY, SEQUOYAH, AND BELLEFONTE NUCLEAR PLANTS - NSRS REPORT NO. R-84-26-WBN - ITEM R-84-19-WBN-01

Reference: Your memorandum to R. M. Pierce dated September 5, 1984 (GNS 840906 101)

132

This memorandum provides a response to this item as requested in the reference. Separate memorandums from R. M. Pierce address items R-84-19-WBN-06 and R-84-19-WBN-07.

Item R-84-19-WBN-01 concerns discrepancies between logic/control drawing and detailed electrical drawings. The specific status of corrective action on these plants is listed below:

Browns Ferry

A review of a sample of electrical drawings from Browns Ferry revealed discrepancies among the logic/control drawings and the wiring diagrams. The discrepancies found indicate that only documentation changes are required. The documentation changes are required as both the operating and engineering personnel presently use both the logic/control and wiring diagrams for determining system operation and design evaluation and changes. The plant configuration is considered acceptable as the construction and modifications are based on wiring diagrams.

OE is developing a scope and cost estimate for a dedicated review of all systems on Browns Ferry. This scope and estimate are scheduled to be completed about mid-November 1984. After that, NUC PR will be requested to authorize the work and provide funding for corrective action. Additional detail can be obtained from a memorandum from N. R. Beasley to E. G. Beasley dated September 21, 1984 (BFP 840921 019).

Bellefonte

During 1981 inconsistencies between Bellefonte electrical drawings and Bellefonte design criteria were identified. A nonconformance report was issued. Corrective action for the nonconformance report was to review FCLDs, schematics, design criteria, and wiring and connection diagrams to ensure that all were mutually consistent. Corrective action has been completed and the nonconformance was closed on July 5, 1983 (BLP 830705 019). Additional detail can be obtained from a memorandum from R. M. Hodges to J. A. Raulston dated September 14, 1983 (BLP 830914 013).

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H. N. Culver 00T 1 1984

BROWNS FERRY, SEQUOYAH, AND BELLEFONTE NUCLEAR PLANTS - NSRS REPORT NO. R-84-26-WBN - ITEM R-84-19-WBN-01

Sequoyah

The condition has not been specifically evaluated for Sequoyah, and we do not know for certain that the condition exists. OE is pursuing the situation as part of the generic applicability of the overall Black and Veatch review. A specific evaluation will be required to establish whether or not the condition exists with the Sequoyah electrical drawings, and if the condition does exist the extent and seriousness. We consider it fairly high probability that the condition does exist at Sequoyah and that the condition is not serious. OE is keeping this Black and Veatch category open for Sequoyah and will reiterate our request to NUC PR to provide authority and funds for the specific evaluation and then for corrective action if necessary.

We agree with the NSRS position that the condition should be evaluated for all plants. The results of the evaluation and corrective action are defined and the item is satisfied for Browns Ferry and Bellefonte. The item should remain open for Sequoyah. We will inform you when the review is complete and any necessary corrective action defined and in a corrective action system.

Back. Amerik

EGB:NCH

cc: E. G. Beasley, W12B21 C-K

N. R. Beasley, 6104 MIB-K

W. R. Brown, 102 ESTA-K

T. G. Campbell, NUC PR, Sequoyan

R. M. Hodges, 1117 IBM-K

MEDS, W5B63 C-K

H. G. Parris, 500A CST2-C

R. M. Pierce, 104 ESTA-K

J. A. Raulston, W10C126 C-K

J. P. Vineyard, A8 Sequoyah - EMG

W. F. Willis, E12B16 C-K

Principally Prepared By: E. Gray Beasley, Extension 6606

BC/SC/PM: 24/9/28 = 100, 88B

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• United states government

Memorandum

TENNESSEE VALLEY AUTHORITY

'83 07 05 **019** BLP

Those listed

R. M. Hodges, Project Manager, Bellefonte Design Project, 1117 IBM-K

JUL 5.1983

83071110167 (4)

SUBJECT:

BELLEFONTE NUCLEAR PLANT - NONCONFORMANCE REPORT NO. BLNQAB8101

Attached is a copy of the subject nonconformance report for which all

J. W. Anderson, M155G MIB-K

L. J. Cooney, W6D224 C-K

L. S. Cox, Bellefonte CONST (3)

MWS:BH

315/5 Attachment

cc (Attachment):

MEDS, W5B63 C-K M. W. Stevenson, 1168 IBM-K

corrective action has been completed.

U13180.05



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UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

BLP '83 0519 020

1 Bellefonte Dasign Project Files

FROM : H. C. Rutherford, Senior Electrical Design Engineer, 1165 IBM-K

DATE : May 17, 1983

SUBJECT: BELLEFONTE NUCLEAR PLANT - DRAWINGS AND DOCUMENTATION REVIEW

Reference: Nonconformance Report (NCR) ELNQAB8101

A design review of system FCLDs versus the design criteria has been conducted for the following system FCLDs.

> 2GW0900-CD 2GW0900-CV 2GW0900-KC 25W0900-KD 2GW0900-RF 20W0900-VA 2GW0900-VC 2GW0900-VE 2GW0900-VK

Reviews for the following system FCLDs will be completed by June 15, 1983.

19X0900-9E 1000900-05 26#0900-m: 2640900-VH

Final report will be issued when listed FCLDs have been reviewed.

cc: E. O. Massey, 1170 IBM-R

J. L. Springer. 1111 IBM-K

M. W. Stevenson, 1168 IBM-K W. A. Tabum, 1148 IBM-K

R. M. Hodges, 1117 IBM-K

5/19/83 - RYE:DG co: MEIS, WEB63 CHK UNITED STATES GOVERNMENT

·Memorandum

TENNESSEE VALLEY AUTHORITY

ត្ស '30629 011

TO -- Fellefonte Design Project Files

FROM : H. C. Rutherford, Senior Electrical Design Engineer, 1165 IBM-K

DATE : JUN 2 9 1983

SUBJECT: BELLEFONTE NUCLEAR PLANT - DRAWINGS AND DOCUMENTATION FEVIEW

- References: 1. Nonconformance Report (NCR) BLNCAB8101

2. My memo to Bellefonte Design Project Files dated May 17, 1983 (BLP 830519 020)

A design review of system FCLDs versus the design criteria was completed by June 15, 1983, for the following system FCLDs:

26W0900-KE 26W0900-ND 26W0900-NV 26W0900-VH

H. D. Farmerford

EDM:EW

cc: E. O. Massey, 1170 IEM-R J. L. Springer, 1111 IEM-R M. N. Stevenson, 1168 IEM-R W. R. Tatum, 1148 IEM-R

R. M. Hodges, 1117 IBM-K

013168.03

6/29/83 - FMM:DG cc: MEDS, WSB63 C-K

BLP830705019

NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET



NCR NO. BLNQAB SIDI

SIGNIFICANT

REPORTABLE YES O

Verified By M. W. Stummer Date 4/29/63

- A. Have any analyses, contracts, memorandums, etc., requiring EN DES work been generated? Yes ≯ No □ If yes, list in (C) below.
- B. Have all ECNs related to the NCR been issued?
- C. Documents related to the NCR (ECN, analyses, memos, contract No., etc.)

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Remarks:			

Page of

TVA 64 (05-4-68)

UNITED STATES GOVERNMENT

Memorandum

J. A. Raulston, Chief, Nuclear Engineering Support Branch, W10C126 C-K

FROM

R. M. Hodges, Project Manager, Bellefonte Design Project, 1117 IBM-K

DATE : SEP 1 4 1983

830923T0150

SURJECT:

BELLEPONTE NUCLEAR PLANT UNITS 1 AND 2 - NONCONFORMANCE REPORT (NCR)

BLNQAB8101 FINAL REPORT

Attached is the final response for NCR BLNQAB8101, "Generic Implications of Failure to Implement Design Criteria in Design Drawings".

Carl W. Hatman

MAN Attachment

cc (Attachment):

J. W. Anderson, M155G MIB-K

E. G. Beasley, W12B21 C-K

W. R. Brown, 102 ESTA-K

L. J. Cooney, W6D224 C-K

H. N. Culver, 249A HBB-K

MEDS, W5B63 C-K

M. N. Sprouse, W11A9 C-K

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2 GENERIC IMPLICATIONS OF FAILURE TO IMPLEMENT DESIGN CRITERIA IN DESIGN DRAWINGS 10CFR50.55(e) REPORT NO. 7 (FINAL) NCR BLNQAB8101

Description of Deficiency

Various functional control logic diagrams (FCLDs) and the associated wiring diagrams do not adequately reflect design criteria requirements. Nonconformance reports are initiated when a drawing discrepancy is found, and as a result, the following nonconformances were writen: BLWBLP8003, BLWBLP8010, BLWBLP8101, and BLWBLP8016. These design discrepancies were discovered when reviewing designs to make revisions.

Due to the apparent trend in failing to properly reflect the design criteria in these design drawings, the subject nonconformance was written to identify the possible programmatic deficiency in the production of the drawings. The cause of this deficiency was determined to be random errors occurring during the design review process.

Safety Implications

Failure to properly reflect design criteria in design drawings could result in the deficient design and construction of safety-related structures, systems, and components, thereby adversely affecting the safety of operations of the plant.

Corrective Action

A review to assure compatibility between the design criteria and the functional control logic diagrams (FCLDs) produced by the Electrical Engineering Support Branch (EEB) has been completed. The review compared the FCLDs with their respective design criteria and the outcome of the review was the identification of several discrepancies. The following NCRs were initiated as a result of the review:

BLPBLP8106 BLPBLP8110 BLPBLP8118 BLPBLP8119 BLPBLP8222 BLPBLP8235 BLPBLP8312 BLPBLP8321

The corrective action for each discrepancy identified is an FCLD revision followed by a revision of the corresponding wiring diagrams (if applicable) since the FCLDs establish instrumentation and control requirements that are implemented by the wiring diagrams. Prior to the FCLDs being transferred to project, the standard procedure was to design and check/verify the

Corrective Action (Continued)

electrical wiring diagrams to the applicable FCLD and design criteria. Now the standard procedure is to design and check/verify the FCLDs to the applicable design criteria and then design/check/verify the electrical wiring drawings to the FCLDs and design criteria.

The FCLDs for Bellefonte Nuclear Plant were produced and revised by the Electrical Engineering Support Branch until the latter part of 1980. The responsibilities of following the changes on this project as well as several other projects, apparently resulted in an inadequate design review. The responsibility for the FCLDs was transferred to the project and design reviews are now performed by project on the FCLDs as well as all other drawings. The identified errors were of a random nature and do not indicate a generic problem.

Preparer

Edwin O. Maney

Reviewer

Chmo C Mattheus
Independent Reviewer

H. N. Culver, Director of Nuclear Safety Review Staff, 249A HBB-K

R. M. Pierce, Project Manager, Watts Bar, 104 ESTA-K

October 4, 1984

223 2 100 2 9

WATTS BAR NUCLEAR PLANT - NSRS ROUTINE REVIEW OF THE RESPONSE TO NSRS REPORT R-84-19-WBN, ASSESSMENT OF THE RESULTS OF THE B&V INDEPENDENT DESIGN REVIEW OF THE WBN AUXILIARY FEEDWATER SYSTEM - NSRS REPORT NO. R-84-26-WBN

RESPONSE TO RECOMMENDATION R-84-19-WBN-06

841015H4542

The response to R-84-19-WBN-01 has been transmitted to you by memorandum from R. W. Cantrell dated October 1, 1984 (QMS 840928 201). The response to R-84-19-WBN-07 will follow by separate transmittal from me.

Please refer to your memorandum to me dated September 5, 1984, transmitting NSRS report No. R-84-26-WBN. This report states that NSRS does not agree that recommendation R-84-19-WBN-06 (concerning application of National Electric Code requirements to 480-volt motor branch protection) is satisfied until:

- 1. Design Guide DG-E2.3.5 is made a mandatory design standard, and
- 2. The design standard invokes the instantaneous trip circuit breaker setting requirements of the National Electric Code from Table 430-152 and properly implements the exception clause.

Design Guide DG-E2.3.5, "480-Volt Motor Branch-Circuit Design and Protection," is generally tutorial and is not suited for conversion to a design standard. However, revision 1 of DS-E2.3.2, "480-Volt AC Auxiliary Power System Performance and Equipment Application Criteria," does require application of sections 2 and 9 of DG-E2.3.5 to motor branch-circuit protection.

These sections deal with maximum ratings of and setting for motor branch-circuit protective devices, and are based on the National Electric Code. Although the code does not apply to power generation facilities, its requirements can be applied to most of our power plant circuits. Design Guide DG-E2.3.5 was developed specifically for power plant application, and while it does not specifically invoke the instantaneous trip circuit breaker setting requirements from Table 430-152 of the code, it does present applicable and adequate guidance for motor branch-circuit protection.

Primarily, DG-E2.3.5 recognizes that good design practice and compliance with section 110-10 of the NEC requires that the selected overcurrent device not only has sufficient interrupting capacity rating, but that it also protects the circuit components under short-circuit conditions. This criteria must be met in ways that allow maximum assurance against motor nuisance tripping. DS-E2.3.2, in referencing section 2 of DG-E2.3.5, requires that the circuit designer consider actual motor data, drive

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Extension 3449

Jr.,

Roop, ပ် 🕏 🕏 ပ

H. N. Culver October 4, 1984

WATTS BAR NUCLEAR PLANT - NSRS ROUTINE REVIEW OF THE RESPONSE TO NSRS REPORT R-84-19-WBN, ASSESSMENT OF THE RESULTS OF THE B&V INDEPENDENT DESIGN REVIEW OF THE WBN AUXILIARY FEEDWATER SYSTEM - NSRS REPORT NO. R-84-26-WBN

RESPONSE TO RECOMMENDATION R-84-19-WBN-06

application, and manufacturer's recommendations to obtain optimal settings for instantaneous trip circuit breakers.

At WBN these considerations resulted in setting all instantaneous trip circuit breakers as near 13 times full load current as possible without exceeding that value. This decision was based on the following information:

Actual motor starting current for typical motor control center loads averaged between six and eight times full load current. Asymmetrical current due to inductive loading can increase this value to a maximum of 1.73 times symmetrical starting current. Molded case circuit breakers typically operate in 10 to 15 milliseconds and consequently trip due to the asymmetrical current value.

Additionally, rated motor data for WBN low voltage power system loads is typically given at 460 volts. In reality, this equipment can normally be operated at up to 110 percent of rated voltage. During motor starting, this increased voltage causes a directly proportional increase in starting

Finally, motor control center loads subjected to slow bus transfer generate internal voltages which add directly to the externally supplied voltage. This condition also directly increases motor accelerating current. Bus transfer test data for medium voltage motors at WBN has shown this value to approach three times locked rotor current. This condition has resulted in resetting instantaneous trip relays for medium voltage motors.

The above factors, when considered concurrently, necessitate a typical setting of 11 to 13 times full load current. This value approximates the manufacturer's recommended setting of 11 times full load current.

This position was discussed with your J. F. Murdock and J. D. Smith by G. R. Reed and W. M. Roop, Jr., of the Electrical Engineering Branch on September 20 and 21, 1984.

> Original Crand 07 11. 11. 1

> > R. M. Pierce

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

23 0629

011

Bellefonte Design Project Files

H. C. Rutherford, Senior Electrical Design Engineer, 1165 IBM-K

DATE

: JUN 2 9 1983

83070710182 (1)

SUBJECT: BELLEFONTE NUCLEAR PLANT - DRAWINGS AND DOCUMENTATION REVIEW

References: 1. Nonconformance Report (NCR) BLNQAB8101

2. My memo to Bellefonte Design Project Files dated May 17, 1983 (BLP 830519 020)

A design review of system FCLDs versus the design criteria was completed by June 15, 1983, for the following system FCLDs:

> 2GW0900-KE 2GW0900-ND 2GW0900-NV 2GW0900-VH

EDM:BW

cc: E. O. Massey, 1170 IBM-K

J. L. Springer, 1111 IBM-K

M. N. Stevenson, 1168 IBM-K

W. R. Tatum, 1148 IBM-K

R. M. Hodges, 1117 IBM-K

U13168.03

6/29/83 - RMH:DG cc: MEDS, W5B63 C-K



VA 64 (08-0-45)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

'83 0519 020 BLP

TO

Bellefonte Design Project Files

FROM

H. C. Rutherford, Senior Electrical Design Engineer, 1165 IBM-K

DATE

: May 17, 1983

83052470089

SUBJECT:

BELLEFONTE NUCLEAR PLANT - DRAWINGS AND DOCUMENTATION REVIEW

Reference: Nonconformance Report (NCR) BLNQAB8101

A design review of system FCLDs versus the design criteria has been conducted for the following system FCLDs.

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Reviews for the following system FCLDs will be completed by June 15, 1983.

2GW0900-KE 2GW0900-ND 2GW0900-NV 2GW0900-VH

Final report will be issued when listed FCLDs have been reviewed.

ANT WRT: BH

cc: E. O. Massey, 1170 IBM-K

J. L. Springer, 1111 IBM-K

M. W. Stevenson, 1168 IBM-K

W. R. Tatum, 1148 IBM-K

R. M. Hodges, 1117 IBM-K

5/19/83 - RMH:DG

cc: MEDS, W5B63 C-K



ATTACHMENT 3A

ADDITIONAL ATTACHMENTS REFERENCED IN
THE RESPONSE TO QUESTION 4
ON THE BLACK AND VEATCH INDEPENDENT
DESIGN VERIFICATION PROGRAM AS FORWARDED
IN THE MAY 30, 1985, LETTER FROM
T. M. NOVAK TO H. G. PARRIS

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IMPACT AND JUSTIFICATION FO	ORM
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the complete by fool love.		
8. Signatures		•
Section Supervisor Head/Project Engineer	Branch Chief	Project
9. Disposition by Design Project Hanager		
Initials late Operation License	and Construction	Before Unit
Place in Control Pile for Po	scible Implemen	tation Per ID-QAR 2

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To: <u>V</u>					Relei	M	7					
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REV. DATE PRE- SECT. GROUP NO. ISSUED PARED SUP, HEAD 1 9-14-87 AND OF UK 2 9-3-82-LANC CEP.	SERANCH E CHIEF CL	LE ASSO	CLOSUE CLOSUE AADDED	E SH.	S LIST. R DESCR	SEVER	RSE SIDE	E VISION	/ocs) 	STEEN STEEN	TOTO PAGE
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Chief, Architectural Design Branch, W4C126 C-K Chief, Civil Engineering Branch, W9D224 C-K Chief, Civil Engineering & Design Branch, W3C126 C-K Chief, Electrical Engineering & Design Branch, W2D224 C-K Chief, Mechanical Engineering & Design Branch, 102SPT-K MEDS, E4B37 C-K
TVA 10575A (EN DES-6-79) TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2576 DATA SHEET NO. ____

AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE EXPECTED	DATE ACTUAL		REMARKS	DN DA-	7
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	47W401-1	/5	9-11-81	9-11-81				
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	1-01A-355		9-77-61	. ,				_
/	1-0/A- 435	1	9-11-81					. /
1	1-011-439	1	9-11-01	9-11-81				Ż
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	1-04-432		9-11-01					ď

TVA 10675E (EN DES-7-79)

ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. _2/

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)	480	90/			3-1	1-82	Change Spring	02.08	11
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	505	4.2					Load Change	02-08	2
+	506	90/					LOAD CHANGE	0208	∐ د
1	400	102	3-1	242	3-1	1-82	LOAD CHANGE	020	3 1
1	1-03A-407				3-2	3-42	NO CONST WORK	02.0	ناء
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	T '	10			4-2	138	New Support	01-0	د
1 1	1.124 401 -/-/							<u></u>	•
1	1-034-494	902	1		3-	1-0/	LOAD CHANGE	02-08	

TVA 10675E (EN DES-7-79)

ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO.____

PPECTED			owa		DATE				_	DN C	EL SAT.	
UNIT	DRAWING OR BA	NUMBER .	267.	EXPECTED	ACT	TUAL		REMARK				4
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TVA 10575E (EN DES-7-79)

ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO.

: 1			ISSUE	DATE		LINE UPDAT	22
PECTED	DRAWING OR S/M NUMBER	REV.	EXPECTED	ACTUAL	REMARKS	REV. NO.	١.
7	1- 03A - 320	17		2-5-02	LOAD & MOVMT CHAP	1650 03-04	2
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+	- 327	3			DATA PT. WAS WEEN		ļ.
+	-328	2			LOAD & MOVMT CHA	NGED	1.
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1	-330	3			· ·		I
	- 33/	1			LOAD & DATA PT. CH	IANGED	l
+	- 332	-			LOAD CHANGE		
-	- 333	+ 7		2-5-82	LOAD CHANGE	▼	I
		<u> </u>					J
	1-01A-391	1		3-1-82	NO CONST WORK	REW 86-03	
	1-01A-311	 ~		1			
	1-034- 442				food Change	43503	
	442				Hew Street Ared		
	1 13				Stout Change to S	•	
					THE PARTY OF THE P		
	1-03A-486	904		4-13-5	2	٧٥-٧٤	
-,-	1. 03A - 365	702	3-12-80	3-8-8	Lood change	? 02-05	•
	- 369	902		1	Loud & Mynt chi	enge	
	- 370	901	1	1	"		
	-372	901	+	+ -	Loud chan	16	
-/-	-374	702	$\tau - \tau$	1	Load & Munt ch	101198	_
	1-03A -375	901		11	Prvised & Redi	SIRME	_
',	-376	901			REVISED & Rede	rened	
	1-03A - 377	901	3-12-80	3-8-8	Load & Mante	change oros	6
	A78400-8-1	1				ind Attacher	ł
	47A40-8-2	1		3-23-6	Relocated Sn	bbor	_
	4/7,400						
2	2-63A-280		5-4-8	25-25-2	2 Lund Change	Calx	_
	1-03A- 49B	3	,	4-15	95		_
		+	1				
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TVA 10675E (EN DES-7-79)

ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO.____

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1	038-1AFW	- RO95	904		6 14			REVISED		12A		ŀ
+	1	- Ro96	901				LOC. C	HANGE		4		ļ
-		-R097	901			- 1	CONST.	MOTH KEE	0	-		ļ
		- R100	902				LOC. CH	ANGE				ļ
		- R 99	401					HANGE		1		ļ
		- 8107	901					CHANGE		104		ļ
		- R109	901				CANET	HANGE RE	11			ļ
\dashv	47A0 60 -	3-3	3					CHANGE				ļ
		3-4	T				LOAD	CHANGE				1
		3-6,	2				<u></u>	CHANGE		24		1
\dashv	•	3-7	2					CHANG		124		ļ
	038- 1AF4	J _ R103	901					CHANG	- .	124		
	1	_ R104	903					WORK RE	a s	104		
+		-R105	901			,	Loc. C	HANG-G		101		ļ
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2	038 - 2A	FW - R95	901		11	4.53	LeAD	CHANGE	1	194		
-		- R97	901				CONST.	WORK NE	Δ	\Box		
\top		- 299	901					CHANGG		į		
+		- K10/	901					WORK RE				
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	47 A0 6	0-3-30	1				LoAD	CHANGE	F	Ţ		
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\top	038-21	FW- 8107	901	· -			LOAD	CHANGE		17/	9	
i		- R109	901		1		LOAD	CHANG				_
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		W 11 1	Ť		\top							_
<u> </u>	03B-1AF	W- R167	902		7-2	2-82		OCATION	V.0 M3	3-11. NSE	1	
-i -	038-1AF		90.		_	2-82	REV. L	ATA PT.	/•			_
+	038- 1AF		90:		_	Z-82	5 5 17 7	OCATION	K	N	~	•
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	 		+	+	+-		 	· · · · · · · · · · · · · · · · · · ·				*

TVA 10575E (EN DES-7-79)

ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO.____

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/ECTED		owa	EXPECTED	ACTUAL	ON DATA S REMARKS REV. NO.	HEET
LYNST	DRAWING OR SAN HUMBER	REV.	EXPECTED	~:•~		7
1	47W427-1H	1		8-2-82	ADDED SUPPORT PURS	12
	-2H	2				
\Box	- 3H					╫
—	47w427 -4	17		5-2-52	ADDED SUPPORT DWGS	_\ <u>`</u>
1	42W401-6	8		7-27-53		ᆚ
	7/00 401 8				Pun t	<u>* </u>
	038-1AFW-2005	901		7-2-82	CANAL CONTRACTOR OF THE PARTY O	12
 '-	- L2	903		2-25-82	CONST DORE COMP.	
		 		8-25-82	COULT WELL EVED	$\top \!$
 - - - - - - - - - 	- 26	90/	 	2-25-82		11
	- 27	901		-	CAUST. WELL ROOM	71
	- 28	905		9-2-82		-++
	-29	704		8-23-82		┥┼
	-210	902		7-23-92		┵
	-211	201	·	1-23-82		┵
	-212	901	<u>'</u>	9-2-82		┵
	-214	903	<u> </u>	9-2-82	DUG. VOIDED WAS ADD	-44
	-215	903		8-23-82	LOAD CHANGE	4
	-216	903		9-2-82	DUG. VOIDED was May	
1	-217	215		8-25-82	LOAD CHANGE	
 	-218	202	,	9-2-82	LOAD CHANGE CONT.	Ш
 	-219	21		1-23-12	1 , , , , , , , , , , , , , , , , , , ,	П
	-220	901		7-2-82	1100 011116	П
-	-225	903		8-23-2		$\exists 1$
 		+	 	8-25-8	1 1 1 1 1 1 1 1	77
 	-228	9/3		2-25-22		11
 	-229	7/2		8-25-82	4 44 44 444	-
 	-231	7/2	1	 	CONST.	-++
	-235	_		9-2-82		#
 	-212/	_		8-25-8		
<u> </u>	03B-IAFW -2157	702	4	8-25-82	LOCATION CHANGE NOT	7
		4-	 	-	 	+
		<u> </u>	.			1
' <u>/</u> _	038-IAFN - VI3	70'		9-2-82		
	038-IAFW - V21	20	<u>' </u>	9-2-82	DUE VOIDED H3-3-M	421/2
		1	1 .			
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TVA 10675E (EN DES-7-79)

ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO.____

		1	160,/6	DATE		LINE 4	q
APPECTED UNIT	DRAWING OR BAN NUMBER	DWG REV.	EXPECTED	ACTUAL	REMARKS	ON CATA REV. NO.	<u>,</u>
		10 Z		1-23-12	LOND CHANGE	05-6	2
i	- 401	912		1-23-12	LOAD CHANGE		Ш
	- 402	242		1-23-82	LOAD CHG. & LOCA	TAN CHE	Ш
		704		1-23-82	LOAD CHANGE	2007	Щ
	-404	77		7-2-82	DNO. VOIDED	-	Ш
	- 405	913		8-23-82	LOAD CHANGE	ACCO	Ш
	-413	90/		8-23-82	LAAD CHANGE		Ш
	-414	901		3-23-82	LAAD CHANGE		Ш
	-415	7/3		9-2-82			Щ
	1-03A -406	902		9-1-82	LOAD CHE WALLED	<u>v </u>	Ш
							1
/	1-038-7/	913		8-25-82	LOAD CHANGE	05-A	2
	- 73	213		1-25-27	LOAD CHANGE	K AGO	Щ
	- 78	943		8-23-82	LOAD CHANGE		Ш
	- 79	902		8-25-82	LOAD CHANGE		
	- 8/	70,3		2-23-12	LOAD CHANGE		44
	-83	912		8-25-22	LOAD CHANGE		Ш
	-82	704	1	9-1-82	LOAD CHANGE	t	1
							丄
	474427-2-31	20			WEN SUPPORT		
7	474427-6-1	20		9-2-82	WEN SUPPORT	05-62	12
	6-14	4			NEW SUPPORT		_
1	47A427-6-1A	RO		9-2-82	NEW SUPPORT	05-02	
	474427-6-18	RO		9-2-82	MEW SUPPORT	05-0	2 2
					CONST. WORK PORT	2	1_
1	038 - IAFW - R3	942		9-1-82	LOAD INCREASE		
1	038 - MFW - 232	703		9-1-82	LOAD CHANGE	N3-3-106	
1	038 - IAFW - R34	701	<u>i </u>	9-2-82	DUG. VOIDED	43-3-462	42
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TVA 10575E (EN DES-7-79)

ENGINEERING CHANGE NOTICE NO. 2572

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO.____

PAGE 9

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TVA 10675E (EN DES-7-79)

ENGINEERING CHANGE NOTICE NO. 25-76.

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO.____

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TVA 10878E (EN DES-7-79)

ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO.

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TVA 10679E (EN DES-7-79)

ENGINEERING CHANGE NOTICE NO.

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TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO.

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PROJECT: Watts Bar MUCIEAR PLANT

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SYSTEM/FEATURE: Various Piping Systems

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ALLEY AUTHORITY ENGINEERING CHANGE NOTICE NO. 2576
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Field Materials as follows

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ENGINEERING CHANGE NOTICE NO. ____

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Field Materials as fortawn

Additional Information

ENGINEERING CHANGE NOTICE NO. ____ TERRESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN. ONE HEUE DATE APPECTED UMIT REMARKS RESIDENCE IN SHIPLARD

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ENGINEERING CHANGE NOTICE NO. 2576 DATA SHEET NO. 2



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ENGINEERING CHANGE NOTICE NO. 2574

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ENGINEERING CHANGE NOTICE NO. 2576

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ENGINEERING CHANGE NOTICE NO. 2.576 DATA SHEET NO. 2

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ENGINEERING CHANGE NOTICE NO. 2576 DATA SHEET NO. ______

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ENGINEERING CHANGE NOTICE NO. 2576

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TVA 10879E (EN DES-7-79)

ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 2

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TVA 10575E (EN DES-7-79)

ENGINEERING CHANGE NOTICE NO. 2574

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 2

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TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN DATA SHEET NO. 2

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TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN DATA SHEET NO. 2

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1+2	47W435 -251	0		11-6-81	SIS	3
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	47W464 -242	0	35 82	4-28-82	CCWS	3
47	47W 400 -211	0		11-13-81	SGBD	3
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1+2	47W435-216	0		10-15-81	SIS	3
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TVA 10879E (EN DES-7-79) ENGINEERING CHANGE NOTICE NO. ... TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN DATA SHEET NO.__ ISSUE DATE NEV. EXPECTED ACTUAL AFFECTED UNIT REMARKS DRAWING OR S/M NUMBER

TVA 10575E (EN DES-7-79)

ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 2

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TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN DATA SHEET NO. 2

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TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. Z

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1+2	418465-363	0	3.3	182	3-17-82			3
4	476432-200	8	1		317.82			
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TVA 10675E (EN DES-7-79) ENGINEERING CHANGE NOTICE NO. TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN DATA SHEET NO._ DI CATA ISSUE DATE REMARKS FFECTED EXPECTED ACTUAL DRAWING OR S/M NUMBER

TVA 10575E (EN DES-7-79)

ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 2

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ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 2

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ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 2

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ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 2

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1:2	475464 - 496	2	6-30-82	9-2-82	N3-70-4A	4-4
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	397	2		9-8-82	. *	
	47 W 427 - 205	5		7-28-82	N3-3-1A, 2A, 9A	
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1	504	0	2-30-43		DELETE	19
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ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 2

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ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN DATA SHEET NO. 2

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ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 2

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TVA 10675E (EN DES-7-79) ENGINEERING CHANGE NOTICE NO. _ TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN DATA SHEET NO. LINE UPO ON DAT! REV. NC ISSUE DATE APPECTED UNIT REMARKS EXPECTED ACTUAL DRAWING OR EM NUMBER

ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 2

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TVA 10575E (EN DES-7-79) ENGINEERING CHANGE NOTICE NO. _ TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN DATA SHEET NO. DN DATT ISSUE DATE AFFECTED UNIT EXPECTED ACTUAL REMA..KS DRAWING OR S/M NUMBER

ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

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TVA 10575E (EN DES-7-79) ENGINEERING CHANGE NOTICE NO. _ TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN DATA SHEET NO._ PAGE LINE UPC ON DAT/ REV. NL ISSUE DATE AFFECTED UNIT DWG REV. REMARKS EXPECTED ACTUAL DRAWING OR SAM NUMBER

ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 2

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142	47W401- 216	0		9-24-8				
	478450-444	3		9-23-82				
	478450 - 445	4		9-23-82				
	478450 - 449	4		9-23-82				
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ENGINEEHING CHANGE NOTICE NO. 2574

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN DATA SHEET NO. 2

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ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 2

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2_	47W 40% - 20C		7-00-00	Delete	N3-62-3A	
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	41W406 -205			! 	N3-62-2A, 15A, 26	<u> </u>
	47W406 - 206				N3-62-1/A, 16A, 22	<u> </u>
	47W406 - 20				N3-62-25A	
	47W427 - 205	5 6			N3-3-1A,2A,9A	
	47W427 - 200	3		Delete	N3-3- 15A	_3
	47W427 - 200	2			13-3- 16A	
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	47W427 210				N3-3-18A	
	- 217			<u> </u>	-18A	
	47W432 20				N3-74-1A	
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i	20				-7A	
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	47W 435 - 21			<u>† </u>	N3-63-4A	
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	47W437 - 20	/	<u> </u>		N3-72-1A	
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İ	47W 450 - 20			1	N3-67-2A,28A	
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ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 2

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2	47W 450	- 208	11	1-30-14	12-22-62	N3-67-6A		Ľ
	47W450	216		3.4	Delete	N3-67-19A, 20A	3100	4
	47W450	- 223	3			N3-67-10A		1
	17W150	- 222		1-4-5	Dolote	N3-67-15A	51	ł
	47W450	- 224			1	N3-67-16A	3/	
	47W450	025				N3-67-17A	31	
1	47W450	- 236			1 1	N3-67-18A	34	Π
-	47W464		5	 	(1.12-4.2	N3-70-1A		Γ
+	· · · · · · · · · · · · · · · · · · ·			 	12-26-36	N3-70-6A		Ī
+	47W464		5	 	 	N3-10-38A,39A		۲
 -	47W464		2	 	 	 		۲
	47W464	- 229	6	 	1	N3-70-36A,37	4	ŀ
	47W464	<i>- 232</i>	2	 	1-10-83			ŀ
	47W464	- 234	L			N3-70-35A		L
	47W464	2387		4-72-77	Delete	N3-70-2R	37	k
	47W491	- 201	3		5-25-83	N3-26-2A		L
-	47W555	- 202			Delete	N3-62-10A	<u> </u>	
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ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 2

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UNIT	DRAWING OR EM NUMBER	REV.	EXPECTED		REMARKS	BEV. NO.
4_	47W427-218	1	4-30-83	3-53-5		/
<u> </u>	47W401 - 216	₩.		3-23-83		
	476492 -201	12			N3-81-1A	
1+2		3	+	T	N3-33-1A	
a	47M Adi- 511	ے د	5.30.83	4.29.83		<u> </u> 2
145	47 W 430 - 232	0		4-28-83		
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4	47 W 450 - 226	14	<u> </u>	<u> </u>		<u>b</u>
_2	478450-578		,	5-10-83		
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2	375	2				
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1	474450-251	Ò	6-30-83	6-8-83	N3-67-28A	2
	478450-364	12			`	
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	418450-626	10	7-20-53	Delete		28
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1	47w435-200	9	7:30-83	7.22-83	N3-63-1A	
٤2	47 W450 - 225	3		-27-83	N3-67-74	
a	47W 427-205	4	1	1 1	N3-3-9A	
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ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN DATA SHEET NO. 1

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2	474750-244	+			De	ere	N3	-67-Z/A	3/	Н
2	4741555-200			/			N3	-62-28A		Y
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SCOPE OF CRANGE ESTIMATE _NUCLEAR PLANT · "ECT NO. 2576 . WATTS BAR BUILDING AUXILIARY SYSTEM/FEATURE: K.R.C.W. 📈 Revisions by this section will not require additional material TRevisions by this section will require additional materials as listed below Requested Unit 1 Unit 2 Procured By PR, Requ, Delivery (EN DES/CONST) or Contr · Lees Qty Qty Date

Michael & Bradley

		ERING CHANGE DATA SHEET I Clant, Spiled City,	NOTICE NO. 2	111	PAGE 1
то:	6M3 501 C3 .		- Released By:	Design Project	Manager
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Project WATTS DAK	Nuch	8 <i>0</i> K		Affected Units	75
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Reference & Description of Change					
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1 18-3-81 JRW From SURV N 2 9-3-82 TN 5 1000 SURV N 3 1/-24-12 2000 VPM Que N	MON ECN D.P. HEF CLERK MGR HAFSM AR A CE 24/	ADDED DR	DESCRIPTION O	BERS	15 14 16
1 18-3-81 JRW DOWN HEAD CH 1 18-3-81 JRW DOWN SOL N 2 9-3-82 TN 5 1994 Sec NI 3 1/-24-82 RMM VPM QC NI 4 :7:5:13 CM 24 1946	MONE ECH D.P. HIEF CLERK MOR HA F5M LAR HA CE ZA	ADDED DR ADDED DR ADDED DA ADDED DA	DESCRIPTION OF AWING NUM AMING NUM ZAWING NU	PREVISION BERS 16825 MBBZS DROWN WAS	15 14 15 14 16
1 18-3-81 JRW Brost SON NEAD CH 2 9-3-82 Th > 1804 SON N 3 11-24-82 RM WAL GE N 4 : 15 13 CM AND GEN 5 2-16-54 ST NAM (FW) (FW) (FW)	MONIECN D.P. MIEF CLERK MGR MA F5M AA A C E 244 A H H 225/ MA U A 25/ MA W	ADDED DR ADDED DR ADDED DA ADDED 26 ADDED 26 ADDED 26	DESCRIPTION OF AWING NUM AMING NUM RAWING NUM RAWING NU RAWING NU REST'M UL	PERS 18EPS M BEZS D MONTH 12 C S WORN 12 C S WORN 13 COM SHIP	1574 1574 16 16 16
1 18-3-81 JRW DOWN HEAD CH 1 18-3-81 JRW DOWN SON N 2 9-3-82 TN > 1994 Ser NI 3 1/-24-82 ZMM VPM QE NI 4 : 15 13 CM AND GENI	MONE ECH D.P. HIEF CLERK MOR HA F5M LAR HA CE ZA	ADDED DR ADDED DR ADDED DA ADDED 26 ADDED 26 ADDED 26	DESCRIPTION OF AWING NUM AMING NUM ZAWING NUM ZAWING NU ZAWING NU ZAWING NU ZAWING NU ZAWING NU ZAWING NUM ZAW	PREVISION BERS 16825 MBBZS DROWN WAS	1574 1574 16 16 16
1 18-3-81 JRW MONTH SOM N 2 9-3-82 TN > 1000 SM N 3 11-24-82 RN WONT GE N 4 -3 15 13 CM MAN GEN 5 2-16-54 ST NAM (MAN) (MAN) (MAN)	MONIECN D.P. MIEF CLERK MGR MA F5M AA A C E 244 A H H 225/ MA U A 25/ MA W	ADDED DR ADDED DR ADDED DA ADDED 26 ADDED 26 ADDED 26	DESCRIPTION OF AWING NUM AMING NUM RAWING NUM RAWING NU RAWING NU REST'M UL	PERS 18EPS M BEZS D MONTH 12 C S WORN 12 C S WORN 13 COM SHIP	1574 1574 16 16 16
1 18-3-81 JRW Brost SON NEAD CH 2 9-3-82 TN S 1894 SON N 3 11-24-82 ZHAN WORL QC N 4 3:5:5:3 CM MA SIMIN C 5 2-16-54 ST NAL SIMIN C 6 50-34 ML SAL SIMIN N	MONIECN D.P. MIEF CLERK MGR MA F5M AA A C E 244 A H H 225/ MA U A 25/ MA W	ADDED DR ADDED DR ADDED DA ADDED 26 ADDED 26 ADDED 26	DESCRIPTION OF AWING NUM AMING NUM RAWING NUM RAWING NU RAWING NU REST'M UL	PERS 18EPS M BEZS D MONTH 12 C S WORN 12 C S WORN 13 COM SHIP	1574 1574 16 16
1 18-3-81 JRW MONTH SOM N 2 9-3-82 TN > 1000 SM N 3 11-24-82 RN WONT GE N 4 -3 15 13 CM MAN GEN 5 2-16-54 ST NAM (MAN) (MAN) (MAN)	MONIECN D.P. MIEF CLERK MGR MA F5M AA A C E 244 A H H 225/ MA U A 25/ MA W	ADDED DR ADDED DR ADDED DA ADDED 26 ADDED 26 ADDED 26	DESCRIPTION OF AWING NUM AMING NUM RAWING NUM RAWING NU RAWING NU REST'M UL	PERS 18EPS M BEZS D MONTH 12 C S WORN 12 C S WORN 13 COM SHIP	1574 1574 16 16 16
1 18-3-81 JRW Brost SON NEAD CH 2 9-3-82 TN SONG SON N 3 11-24-82 ZNM WORL QC N 4 3:5:5:3 CAR MAY GEN 5 2-16-54 JET NAU CHILL (1) 6 50-34 MY 2-14 JETH N	MONIECN D.P. MIEF CLERK MGR MA F5M AA A C E 244 A H H 225/ MA U A 25/ MA W	ADDED DR ADDED DR ADDED DA ADDED 26 ADDED 26 ADDED 26	DESCRIPTION OF AWING NUM AMING NUM RAWING NUM RAWING NU RAWING NU REST'M UL	PERS 18EPS M BEZS D MONTH 12 C S WORN 12 C S WORN 13 COM SHIP	1574 1574 16 16 16

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2576 DATA SHEET NO. 3

FFECTED	DRAWING OR B/M NUMBER	DWG REV.	ISSUE EXPECTED	DATE ACTUAL	ı	REMARKS	HEY
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1.	1-62A - 711	3	1/16/82	1/10/82	08-06		
1	471465-1	17	2/23/82		13-11		
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ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 3

AFFECTED		owa		DATE		UNE UPDATED
UNIT	PREMUM WAS NO DRIWAND	REV.	EXPECTED	ACTUAL	REMARKS	PRY, NO.
1	1-62A-17	1	R ZZ BI	15 25 8	08-01	2
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1	V 23	1	+	•	08-01	
1	1-42A- 071	5	12/16/81	2/16/81	08-03	
1	1-63- 283	4	12/17/81	12/17/81	09-10	
1	230	4	1		09-10	
l l	237	2	\rightarrow	+	09-10	
4	1- 084 176	4	12/16/81	12/14/81	delete machalas	
2	62-2LLV- R41	2	12/17/21	12/17/81	555-208	
1	1-43-102	4	2/5/82	2/5/82	09-04 TECH 25% AS PAST W	S THE PARTY
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	257	>03	HITBL	6/17/82	09-08	1
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1	1-62A - 536	1	1	1		
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1	1-62A- 402	1	1 20 82	1/20/92	08-15	
1	471.060-63-7	2	2 8 82	218/82	445-202	
1	47W555-15	9	1/22/82	1/22/82	555-205	
	62-1LLY- 2201	11	1/22/82		555-205	
1	62-16VC-R80	3	1/22/97		406-201	
1	62-16NG-R113		1/22/82	1/22/82	406-201	
. 1	1-74-006	1	1/27/82	1/27/82	03-01	
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ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN DATA SHEET NO. 3

AFFECTED	<u> </u>	owa	ISSUE	DATE	LIME UPDA* ON DATA S	_
UNIT	DRAWING OR BYM NUMBER	AEV.	EXPECTED	ACTUAL	REMARKS REY, NO.	4
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	320	2	1/26/82	12482	*	
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	57	4	1	1	1	\prod
	58	4				\prod
	72	5	4	•	•	\prod
1	47W435-8	20	8/14/82	8/1482	435-216	\prod
1	47W435-9	20	81482	8 1482	••	\prod
+	-62-14CH-P177	-			355-212 BANDE	\prod
+	62 HOW RILE				555-213- TAT	
4	-62-1641 - R155-				555-213 ₩' V	\prod
1	1-67-004	901	2 5 82	2/5/82	15-01	\prod
	72-165-V14	305	2/18/82	2 18 32	437-200	
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ENGINEERING CHANGE NOTICE NO. 2976

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

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PURPOSE AND SCOPE

The NSRS performed an assessment of the results of the Black and Veatch (B&V) Independent Design Review of the Watts Bar Nuclear Plant Auxiliary Feedwater System and documented the results of the review in NSRS Report R-84-19-WBN dated July 5, 1984. The report provided five recommendations and requested that NUC PR provide NSRS with a plan of action to respond to the recommendations. The memorandum from H. G. Parris to H. N. Culver dated July 31, 1984 (EDC 840801 601) provided the response to the recommendations and stated that all findings could be closed. This report provides the results of the NSRS evaluation of the response and provides the status of the recommendations.

II. SUMMARY AND CONCLUSIONS

As a result of the review, the NSRS has determined that adequate corrective action has been completed to satisfy four of the seven recommendations. NSRS has also determined that the response to three recommendations provided insufficient corrective action to warrant closeout.

III. STATUS OF PREVIOUSLY IDENTIFIED ITEMS

All of the responses to the seven recommendations made in the nemorandum mentioned above (EDC 840801 601) were examined. Based upon the review, four of the recommendations are satisfied and three remain open. The details of the NSRS action follow:

A. R-84-19-WBN-01 (Category 3)

This recommendation was not fully complied with since it referred to all TVA plants and the response only addressed WBN. As part of this follow-up review, NSRS has examined a number of drawings which were changed under ECNs 4666 and 4667. The changes appeared to clarify and correct the drawings listed. A large number of logic and control drawings were changed. Therefore, NSRS considers this issue satisfied for WBN due to the corrective actions taken and verified. The extent of the problem identified by B&V and identified by this item in the NSRS report is endemic to EN DES drawings for all plants. Therefore it will remain open until EN DES completes a similar review and makes corrections as needed for SQN, BLN, and BFN logic and control drawings versus electrical drawings and termination lists. It is understood that this review for other plants is being performed as a result of the generic review of the B&V findings. NSRS shall be made cognizant of the results of this generic review and upon evaluation will determine if sufficient action has been taken for satisfying this item. A related item is R-84-19-WBN-05 (see below).

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TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

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1	47A060-62-14	20	013	182	8/2	Br	400	<u>٠ ٧</u>	5			
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ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 3

AFFECTED UNIT	DRAWING OR BYM NUMBER	DWG REY.	EXP	ISSUE	DATE ACTUAL	\exists		REMARKS	DINE UPDA" ON DATA SI REV. NO.	
	1-68-239	50 l	0 31	82	न्य ह	2	13	-010		2
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	237	903			4448	_	9-15- r .	<u> </u>		Ц
	233	200			4240	2	$\overline{\nu}$			Ц
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	240	201		<u> </u>	42.0	2	4-158			Ц
2	2-68- 231		40	5 53	A /-/-			- THE STAN BEZ		$\!$
	232	901	_		31418	2				Ц
	- 234				A 1 :	=		To 5 ch 1/ 42		
	235	201	<u> </u>		A 182					H
	239	901		<u> </u>	1/4/2	٤				\coprod
	241			=				This phyles		Н
	243	201			War Ca					Ц
	245	100	<u> </u>		3 mls	2				Ц
	252	901	2/21	193	10-12-	32				Ц
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	238_	201	L		9/40	2				Ц
	253	200	L	1	914.8	2				Ц
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	233	90	<u> </u>	<u> </u>	4					Ц
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	240	201	_	<u> </u>	9/4/8		· · · · ·	<u>Y</u>		$\!$
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	1-63-390	201	4	<u> </u>				-03		Ц
	412	30	_	<u> </u>	+			-03		1
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1	1-68-257	306	93	82	alaye	F	-18	-06		$\!$
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ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 3

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AFFECTED		owa			DATE			LINE UPDATED ON DATA SHEET
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(1-63-072	301	8/3	82	8/9	82	03-02	2
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(47A435-8-74	١	8/3/		-	82		
ı	1-62A-584		8/6/			82		
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l	1-63-071	905					02-02	·
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7	2-63-239		<u> </u>					
1	1-48-242		0/31					
2	2-68-242	>0	0/3	182	러	31/82		
Z	2-68-231		12/3	12	1-6	<u>1-83</u>		
	- 232	902		1		<u> </u>		
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ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 3

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2	2-68- 250	902	12/20/02	1-4-83		3
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	2-62A - 258	902		1-4-83		
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	-298	904		1-20-83		
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AND AND CV. DATE	PRE-PARED	n of Ch	NU	-A-	SEE A CLERK	DATO CA	E OSURE	SH.	PIP PWY	T, REV	Z VEF	L1	\$?	- O	ORA DRA	A 3		PAGE 4
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DATE O. ISSUED I I 9.82	PREPARED	SECT.	NU	-A-	SEE A CLEAN MYO	DATO CA	E OSURE	SH.	PIP PWYJ GS LIST	T, REV	Z VEF	L1	\$?	14, fo	apd apd	Page Rubb	(207 13	rott pac
DATE O. ISSUED I I 9.82	PREPARED	SECT.	GROUP HEAD	-A-	SEE A CLEAN MYO	SSOCIAL SOCIAL S	E OSURE	SH.	PIP PWYJ SS LIST	T, REV	Z VEF	L1	\$?	14, fo	apd.	A T	(10)	rott pac
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Chief, Architectural Design Branch, W4C126 C-K Chief, Civil Engineering Branch, W9D224 C-K Chief, Civil Engineering & Design Branch, W3C126 C-K

Chief, Electrical Engineering Branch, W8C125 C-K Chief, Electrical Engineering & Design Branch, W2D224 C-K Chief, Mechanical Engineering & Design Branch, 102SPT-K MEDS, E4B37 C-K
TVA 1097SA (EN DES-10-79)

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2576 DATA SHEET NO. 4

*AGE 2

AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE EXPECTED	DATE ACTUAL		REMARKS	REV.
1#2	47W450-23	10	3-1-81	2-19-81	<u> </u>		
2	47A450-2-109	1	6-15-81	6-6-81		·	
122	47W560-18	/2		12-10-81			
/	47A454-2-41	3	 	12-10-81	No COL	KST work	
132		10		12-14-81			
182		12		12-16-81			
182	47:0454-2	22		12-18-81			
182	" -4	20		12-18-81		·	
11	" -1	21		12-28-8			
1	1-70-001	2				15T work	
•	" -012	1		<u>†</u>	., ,	, ,,	
"	'' -030	2		<u> </u>	/ /	, 11	
11	" -041	3		,	11	, ,,	
- 11	" -045	1,		1	"	//	
. 1	11 -046	4		J	,,	11	
,,	47A454-2-25	4		1/18/83		••	
11	1-70-285	2			. "	**	
	70-1CC-V195	6			**		
"	" -R196	Z		1	••	" "	
••	" -V198	6			"	11 6	
••	" -R199	5		1	"	n 11	
.,	" -V200	3		1	10	11 11	
.,	" -R203	Z		4	"	" "	
"	" -RZOS	3		1	••	"	
"	" - RZXB	4		T.	**	<i>i</i> , ,,	
127	47W464-7	16		1/25/82		1	
11	" -//	12		3			
"	476450-3	25		2/1/82			
,,	474492-4	7		2/16/82			
	E1-1ERCW-R303	901		4/5/02	0 1	150-00 00 2 10010 - 194-00 5	756
1	72-1C5-R77	902		5/24/82	No Com	st work	
2	47A450-8-16	3		7/1/82	No Co	net work	
!	1	907		7/4/8:		., ,,	
/丝*	47W450-ZI	16	7	7/2/82	1		
122	112. 1150-21		I	4			
/42	476450-24	16	1	+ , , -	 		
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ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 4

		T	18606	DATE	t			LINE UPDAT	50	1
PECTED	DRAWING OR S/M NUMBER	REY.	EXPECTED	AC	TUAL	AC	MARKS	REY. NO.	1	
2	47W450-28	0		7/	2/02				μ	1
182	-3	26		2/	182				4	1
	-6	16		_					\sqcup	4
	-7	15							Ц	4
	-8	14			<u> </u>				Ц	4
	-9	17							Ц	4
	-10	15						•	$\!$	4
	-14	15							Щ	4
	-19	19							Щ	
	-20	13		•					Щ	4
2	67-IERCW-R575	902		2/	15/82	No con	IST work		\parallel	1
2	→ -R577	903			<u> </u>	1	· · · · · · · · · · · · · · · · · · ·		\coprod	1
	47A450-20-3	1				16CONST	work		11	1
	↓ -2	1							Ц	╛
	-1			L	<u> </u>	•	····		Ц	1
	474454-3-16	2		7/	19/82	No CONS	Twork		Ц	1
	-23	3			1		L		Ц	
	-40	1		$\lceil \rceil$	7				Ш	
	-73	17			1				\coprod]
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	16	12		_			Ref 7/17/5	2	Ш	╛
	474454-2-29	4			T				Ш	╛
	-31	4							Ц	
1	12-144B-RO39	903		7/	22/2	No CON	ST work		Ц	╛
	1 -R042	905	1				<u> </u>		Ц	
	- R043	905	1						Ц	
1	-R049	902	2						Ц	┙
1	-R050	904	1			<u> </u>	6		Ц	┙
1	-RC67	905	<u>† </u>		\perp			, in the second	Ц	╝
	67-IERCW-R150	901							Ш	
	-R163	906	1						Ц	
_1	-R164	905	T						Ш	
	-R240	902							Ш	
7	-R261	902								
	-8263	905			1		4		\prod	,

ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN DATA SHEET NO. 4

			18848	DATE			LINE UPOP	•.
APPECTED	DRAWING OR S/M NUMBER	REY.	EXPECTED	ACTU	<u>~</u>	REMARKS	DN ORT/	l
	67-IERCW-R264	904		7/2	242	No CONST WORK		
2	- R552	904		1/2				
,	474060-67-15	4						Ш
2	474450-3-172	1						\coprod
2	1 -8 10	3			曰	- Raf 7/22/82		Ш
3	-8-12	4			\Box	Port 7/22/82		\coprod
2	12-1AAB-RO41	905		7/23	12	NO CONST WORK		\coprod
1	67-1ERCW-R259	902				CONST WORK		Ш
1	-R265	901						\coprod
1	474431-10-1	2		7/24	/BZ	No CONST WORK		Ш
1	-5	2				CONST WORK		Ш
2	- 8	3						\prod
1.1	-31	2						\prod
-1	-32	$\coprod I$				J		\prod
2	474450-3-115	2				No CONST WORK		Щ
2	67-/ERCW-R542	904				<u> </u>		
2	47A450-3-41	Z		BIA	6/82			_
1 -	474454-3-86	3						
	67-1ERCW-R213	901						\prod
. 1	- RZ16	901		\coprod				#
	-R22Z	102		\coprod				1
1	-R223	904						#
	-R225	901		\prod				#
2	-R525	90Z		\prod				#
2	-R530	902		\coprod				4
2	-R53z	902		\coprod		-		#
2	-R534	903		1				#
	-R135	904		14		† ***		#
2	-Rack	901	1			- Alexandra		#
	67-1ERCW-R300	904	1	8/15	182	No COUST WORK	···	μ
142	67-1ERCW-R296	901		1				\coprod
/	67-1ERC P364	903	\$ <u> </u>	8/3	28/2			' [
1	-R387	907		1				, +
1	- R.388	904	1	\sqcup				#
	-R395	925	·					\prod
	+ -R406	902				,		1

ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 4

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\overline{I}	67-1ERCW-RS	7 904		8/30/12	No COUST WORK	
1	-Ru					
	-R4					
	-841	0 903				
	V -RY			+	<u> </u>	
	47A450-4-46	3		9/1/82		
	67-1ERCW-R16				11	
-	" - R19	1 90%			,	
	47A431-10-10	2				
2	47A450 - 3-5044	-50B Z		•		
2	474450-4-26			9/3/82		
\overline{L}	↓ -34	1				
٤	47A060-67-16	5				
1	67-IERCW-RI	19 903				
	-RZ	•				
	-RZ	45 903			·	
	-R2	56 905			<u></u>	
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ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 4

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7	476454-2	24		10/4/82	·	Ш
1	1-70-322	902			No CONST Work	Ш
1	67-IERCW-R335	902				Ш
1	70-166-R090	905			CONST WORK	\prod
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ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

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	67-18RCW-R168 SN/	305		97.R		
	67-REACW-R471 SAI	703		9.7.82		
	67-1EACW- RUTI SHZ	903		9-7-82		
	67-1ERCW-R476 501	901		4-7-82		
	67-1ERCW-R476 SNZ	901		9-7-82		
	67-KERCW-R479 SN/	904		9-7-82		
	67-1ERLW-RY96 SH/	903		9-7-12		
	67-1ERCW-R496 SHZ	903		9-7-82		· · · · · · · · · · · · · · · · · · ·
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	67-1ERCW-R582 41	902		9-7-82		
	67-1ERCW-R574 SH/	901		9-7-82		
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	47A450-3-110A	0		9-10-82		#CN 1752
	47A450-3-179	0		9-13-82	3ELund	C- 24-53
	47A450-3-76	2		9-17-12		
	47A 450-3-114	1		9-17-92		

ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

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ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 4

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TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN.

ENGINEERING CHANGE NOTICE NO. 2576 DATA SHEET NO. 4

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Additional Information:

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TENNESSEE VALLEY AUTHORITY DATA SHEET NO											
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TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN.

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DIVISION OF ENGINEERING DESIGN

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ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. ________

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ENGINEERING CHANGE NOTICE NO. 2576

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ENGINEERING CHANGE NOTICE NO. 2576

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ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

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ENGINEERING CHANGE NOTICE NO. 2576

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TENNESSER VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN.

ENGINEERING CHANGE NOTICE NO. 25% DATA SHEET NO. ______

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Referred:	H. B. Roshi /10 8-12-82
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vick, Hydro, & Spec Proj Eng & Dail A 1 Arch	Required for PSAR or FSAR Required for Preoperational Test: Yes
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unites /	Vendor(s) involved:
CC (Attachments): by (Vo./2) Chief, Architectural Craftin Branch, W4C126 C-K	Chief, Nuclear Engineer, W10C126 C-K
Chief, Civil Engineering Branch, W9D224 C-K Chief, Civil Engineering & Design Branch, W3C126 C-K	Chief, Mechanical Engineering & Dassgn Branch, 102 SPT-15 Chief, Quality Assurance Branch, W11C126 C-15 Manager of Construction, E7826 C-15
Chief, Electrical Engineering Branch, WBC126 C-K Chief, Electrical Engineering & Design Branch, W2D224 C-K MEDS, 109 UB-K	Chief, Cost Planning and Control Staff, W12C74 C-K Plant Superintendent

-UNITED STATES COVERNMENT

Memorandum

LETURN TO _ RT FOR FILE

TENNESSEE VALLEY AUTHORITY

MEB '82 0603 008 J. E. Wilkins, Project Hanager, Watts Bar Nuclear Flant, CONST (3)

FROM

J. C. Standifer, Sequoyah and Watts Bar Pesign Projects Manager, 204 GB-K

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'JUN

SUBJECT:

WATTS BAR NUCLEAR PLANT - AUXILIARY FEEDWATER PUMPS AND DRIVES - CONTRACT 74C30-83094 - INGERSOLL-RAND

NCR'S 3775R AND 3755R-R1 - N3M-94

References: 1. Memorandum from H. B. Rankin to C. A. Chandley dated February 17, 1982 (SWP 820218 112).

- 2. Memorandum from R. W. Cantrell to you dated January 27, 1982 (MEB 820127 019).
- 3. Appendix E of the YCN General Design Criteria for Mechanical Component Quality Groups and Seismic Classification, Revision 2, dated April 17, 1979 (ESS 790419 202).
- 4. Memorandum from J. A. Raulston to L. M. Mills dated April 27, 1982 (NEB 820427 260).

We were informed by your J. F. Hagy that WBN-NCR-3755R-R1 supersedes WBN-KCR-3775R. We have the following comments regarding the equipment listed in NCR-3755-R1 (transmitted by reference 1).

Guidelines for treatment of components that are located in systems with a TVA safety classification of A, B, or C but not designed to ASME Section III requirements are outlined in Appendix E of the Yellow Creek General Design Criteria for Mechanical Component Quality Groups (reference 3). Those guidelines are followed in the information presented below.

The auxiliary feedwater pumping units for Watts Bar Nuclear Plant were procured to the design requirements that were in effect for this equipment at the time of its purchase. Those requirements placed the ASME Section III Class 3 code stamp on the pumps only. For the pumps, that corresponds to TVA Safety Class C. The turbine was designed and banufactured in accordance with applicable sections of ASME III Class 3, including Seismic Category I requirements, but with no code stamp required since the ASME code is not applicable to drive turbines and since no drive turbine manufacturer possesses an N-stamp.

Accessory components for the turbine and motor-driven pumps are manufactured in accordance with the applicable vendor and industry standards with the addition of Seismic Category I requirements. These requirements exceed TVA Safety Class G on the design and manufacture of

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ATTACHMENT SHEET 200 25

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J. E. Wilkins

JUN 3 1982
WATTS BAR NUCLEAR PLANT - AUXILIARY FEEDWATER PUMPS AND DRIVES - CONTRACT
78C30-83094 - INGERSOLL-RAND

HCR'S 3775R AND 3755R-R1 - N3M-94

The contractor for this equipment was required to do all work within his scope of supply under a quality assurance program that conforms to the requirements of 10CFR50, Appendix B. Provided the auxiliary feedwater motor and turbine driven pumps and drivers and their accessories are installed in accordance with TVA Safety Class C requirements, the basic intent of reference 2 will be met and the equipment will be suitable for the intended service.

The components listed below are listed with the same item numbers as those used in NCR-3755R-R1, Appendix A-1:

ITEM 1:

Jet compressor for turbine shaft seal leakage - This component is within the turbine package scope of supply. It was purchased to the manufacturer's standards with full seismic requirements and represents the best available commercial grade product at the time of purchase. As noted above, this is similar to a TVA Safety Class G component installed to TVA Safety Class C requirements. This component is fully adequate for the intended service when installed properly by CONST (i.e., according to TVA Safety Class C requirements for installation and support).

ITEM 2:

Pressure control valve (PCV) for jet compressor steam supply - This component is within the turbine package scope of supply. As noted for the jet compressor, the PCV was purchased as the best available commercial grade product, similar to TVA Safety Class G with Seismic Category I requirements for installation in a TVA Safety Class C system in accordance with Class C requirements. This component is fully adequate for the intended service, when installed properly by CONST.

ITEM 3:

Steam traps for the turbine lowpoint drains collection header—The traps serve to keep steam (at or below 5 lb/in²g) passing out of the drain collection header into the turbine room where it would seriously degrade the turbine room environment. These traps were produced directly by TVA to Seismic Class I (L), Safety Class G requirements, and represent the best available commercial grade product of standard manufacture. The traps have

ECN NO. 3 197 ATTACHMENT / SHEET 3 OF 4

J. E. Wilkins

'JUN 3 1982

WATTS BAR NUCLEAR PLANT - AUXILIARY FEEDWATER PUMPS AND DRIVES - CONTRACT 74C30-83094 - INGERSOLL-RAND

NCR'S 3775R AND 3755R-R1 - N3M-94

a design pressure of 150 lb/in²g and are being utilized in a drains system with a design pressure of 5 lb/in²g. This represents a very conservative design margin for the traps. A failure of the traps in the open position would cause x slow degradation of the turbine room environment, resulting in eventual loss of equipment function. A failure of the traps in the closed position would cause water to back up in the various drain lines. This would not prevent the turbine from starting or continuing to run. Since the traps represent the best available equipment for this application, they are acceptable for use as is, provided they are installed in accordance with TVA Safety Class C requirements.

ITEMS 4, 5, 7, AND 8:

Lube oil cooler and oil piping for the turbine and motor driven pumping units - These components are located within the vendor's scope of supply for the pumping units. They were purchased to manufacturer's standards with full Seismic Category I requirements and represent the best available commercial grade products, similar to TVA Safety Class G requirements for installation in accordance with Class C requirements. These components are fully adequate for the intended service when installed properly by CONST.

ITEM 6:

Turbine manifold (lube oil cooling water) piping — This piping is located within the vendor's scope of supply. It was purchased to manufacturer's standards with full Seismic Category I requirements and represents the best available commercial grade products, similar to TVA Safety Class G requirements for installation in accordance with Class C requirements.

These components are fully adequate for the intended service when installed properly.

ITEM 9 AND 10:

Turbine governor valve and trip/throttle valve - These valves were designed and manufactured in accordance with TVA Safety Class C (Seismic Category I) requirements as well as the best manufacturing requirements available. No N-stamp was required. Turbine grade valves such as these are not obtainable with an N-stamp. In addition to the above, it should be noted that valves of this design were subjected to extensive seismic

J. E. Wilkins

'JUN 3 1982

WATTS BAR NUCLEAR PLANT - AUXILIARY FEEDWATER PUMPS AND DRIVES - CONTRACT 74C30-83094 - INGERSOLL-RAND

NCR'S 3775R AND 3755R-R1 - N3M-94

qualification tests by Terry in the type tests for seismic qualification of their turbine. The valves are fully adequate for the intended service. While investigating these valves, their design pressure was questioned by your Jim Hagy. We have confirmed that the turbine valves are rated for the maximum steam inlet pressure of 1226 lb/in²a and 570°F per the turbine data sheet (instruction book) and the equipment design specification.

ITEM 11:

Motor driven pump lube oil console. This equipment is supplied within the scope of supply of the motor driven pumping unit. It was purchased to manufacturer's standards with the addition of Seismic Category I requirements, and represents the best available commercial grade products, similar to TVA Safety Class G, for installation in accordance with Class C requirements. This equipment is fully adequate for the intended service if installed properly by CONST.

In order to fully rest the concerns of this NCR, you need to verify that all of the subject equipment is installed and supported to TVA Safety Class C requirements. We will revise the auxiliary feedwater flow diagram (47W803-3) to indicate the vendor scope of supply and TVA safety class boundaries as they apply to the interfaces between TVA and vendor supplied piping. The FSAR will also be revised accordingly.

Original Signed By J. C. Standifer

J. C. Standifer

CAC: RT KJH

cc: R. O. Barnett, W9D224 C-K

F. W. Chandler, W8C126 C-K

C. A. Chandley, W7C126 C-K

H. H. Mull, E7824 C-K

M. N. Sprouse, W11A9 C-K

J. A. Raulston, W10C126 C-K

MEDS, W5863 C-K

Principally Prepared By: R. Tucker, extension 4581

E82152.07

DIVISION OF CONSTRUCTION MP-QC1-1.2 NONCOMPORMING CONDITION REPORT , ATTACHMENT AL NCR. 3755R 31 1. Nuclear Project: WATTS BAR MUCLEAR PLANT Unit OYM DM ☐ Instrumentation Civil C Electrical Mechanical Z. Ares: Other 3. Activity Receiving Storage Fabricating Dimtalling ☐ Tooting 4. Type: Damage Pallure Defect Documentation Other 5. Hem Description: See attachment A2 Drawing #47W427-8,R10 1) He objective evidence exists that these items conform to 6. Nonconformance Description: (Include Apparent Cause) ASNE class 3, TVA class 3, Requirements as shown on the cited drawing. 2) No quality standards (code or TVA) or design conditions are specified for Vendor's accessories to be installed by TVA. Recommended Disposition: Rework Reject Repair Uta-As-Is Other
(Check Block & Detail Below) EN DES to review item acceptability and provide appropriate quality standards and design conditions. Action Required to Prevent Recurrence: REVISION I DE INCLUDE ADDITIONAL MATERIAL " February 5, 1982 Date ___ NCR Initiator: 7. Referred to Design Project Organization (DPO): Yes No Disposition: As Recommended Other (Describe). OPO Coordination Contact . Significant Condition Yes Date Approved by Construction Engineer: Other (Describe) As Recommended Date Approved by Design Project Organization: 9. Disposition Inspection and Release from Nonconforming Status: Inspected by: ☐ Yes 10. Action Required to Prevent Recurrence Complete: Date Verified by Construction Engineer: Disposition Reviewed and Accepted By: Distribution: Site QA Records File Construction Engineer Project QA Unit Date

QA Marager, OEDC

OHS NSRS (Significant NCR's only)

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EN DES NEB-NLS (Significant NCR's only)

Authorized-Nuclear Inspector

NONCOMPORATING COMPITION RE Medicar Plant CONTINUATION PAGE REMARKS ' Jet Compressor (DMG. # 760-X1DLJ, RL) (1) 1. 1-PCV-3-183 (DWG. # 10/2.4.1.8) (1) 2. Steam Traps, MK # 47W-27-2, SARCO INSTALLATION INSTRUCTIONS NO. 360-07 July, 1979) (1) 3. Oil Coolers (AMETEC DWG. # 5-44143-4-042) (2). 4. Dil Coolers (AMERICAN STANDARD DWG. # 5-142-02-019-015) (2) 5. Manifold Fiping (I-R DWG. ≠ C-3MMTA 321x39A and C-5MMTA321x90D) (2) 6. Dil Piping (TST DWG. #88402D and I-P DWG. # 0-5EMTA321x101A) (2 7. 9. Oil Piping (I-R DWG. # 7-SHWTA321x4CA) (2) Sovermor Valve (TST DWG. - 67063D) 21 9. Trip & Throttle Valve (GIMPEL DNG. * NP-1355) (2) Tube Oil Console (IHR DWG. # DHRMTAS21x37A) (2) ::.

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Construction Project Manager
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TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN.

ENGINEERING CHANGE NOTICE NO. 3/98 DATA SHEET NO. ____

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ENGINEERING CHANGE NOTICE NO. 3/9/

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. ____

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TVA 10075E (EN DES-7-79)

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TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

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TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

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TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3/96

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TENNESSEE VALLEY AUTHORITY

ENGINEERING CHAMSE NOTICE NO. 2196

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To: Construction Project Manager SWP 204 GBK 84060480009 SWP 204 GBK 84060480009 SATE JAN & I BAL JAN	To: Construction Project Manager SV From: Design Project Manager JAN & I BUX DATE AND THE REQUIRED YES Project Engineer Released Project Engineer Released Project Engineer Response of Change Full The Suction Project As a Project or Date of Change Full The Suction Project As a Project or Date of Change Full The Suction Project As a Project or Date of Change Full The Suction Project Engineering Branch Civil Electrical Mechanical Nuclear Civil Electrical Mechanical Nuclear Civil Electrical Mechanical Muchanical Nuclear Civil Electrical Mechanical Mech Comb - 2 Policy Arch, Hydro, & Spec Proj Eng & Des	SCO SCO SCO SCO SCO SCO SCO SCO SCO SCO	COPE Mame Larye pare	ign Project M ALSA ANSA Any of pre-	ALOGO LA SUL	BOODS LAND MITTER LAND LAN
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EN DES-EP 4.40 Attachment No. 1 Page 1 of 7

IMPACT JUSTIFICATION ANALYSIS
13/8CH NO
IJ 10
DCR 80
PART I (COMPLETED BY LEAD ENGINEER OF INITIATING BRANCH/PROJECT)
PROJECT WANP PROJECT CODE 85 - ACCT NO. M7-284-7
. REASON FOR ANALYSIS:
A. HRC/OTHER MANDATED REGULATORY
3. DESIGN IMPROVEMENTS/CRITERIA CHANGES
C. REQUESTS FROM OTHER TVA DIVISIONS . F. PREOF TEST DEFICIENCY
☐ G. OTHER
. DESCRIBE: REVISE DINCE AS REC'D BY REANALYSIE
FOR NCR WANCES FULL.
. TIME FRAME FOR IMPLEMENTATION:
A IMMEDIATE - ESSENTIAL FOR UNIT OPERATION OR SAFETY.
B. AFFECTS OPERATING RELIABILITY/AVAILABILITY. INPLEMENT BY (DATE)
C. IMPROVES OPERATING EFFICIENCY, FLEXIBILITY, OR CONVENIENCE. MAY BE DEFERRED.
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LEAD ERGRESS / DATE
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SUPERVISOR DATE
1/14/67
GROUP NEAD/PROJECT ENGINEER DATE
710.12 styl 1/10/82
BRANCH CHIEF DATE
EN DES EP 1.18 COST ESTIMATE ATTACHED YES NO
DICT 2 (COURTETER BY COST SHOUNGER BRAISSTIARBOOKIN AS ISLA BRINGIN
PART 2 (COMPLETED BY COST ENGINEER PROJECT/PROGRAM OR LEAD BRANCH)
5. POTENTIAL SCHEDULE IMPACT TO CONST/POWER: IPOTENTIAL IMPACT ITEM NO
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6. DOES CHANGE AFFECT HAJOR SCHEDULE MILESTONE OR ACTIVITY ON CRITICAL PATH OF PLANT
SCHEDULE? TYES AND IF YES, LIST EFFECT:
7. AGREED TO BY CONST/POWER? TES THE TOTAL
CONSTITUTE STONATORE
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EN DES-EP 4.40 Attachment No. 1 Page 2 of 7

A DESIGN & PROCUREMENT SCHEDULE

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ZN DES-EP 4.40 Attachment No. 1 Page 3 of 7 13/ECN No. 32./ IJ No. EN DES MAN-HOURS PART 3-B Design and Procurement (D&P) Costs (preliminary estimates) <u>Activity</u> Organization Man-hours No. of Dwgs. Market Africa 150 TOTAL Organization Date PART 3-C EN DES COST SUMMARY *\$3135* Average Cost Per MH 20.90 X Total Man-Hours /50 = Total EN DES Labor Cost Contracts 1300 MHS (Gilbert) 49,400 Miscellaneous Direct Costs 10% 3/5 Indirect Expense 40% 21,140 PKM 1/1+/22 11,010 Contingency 15% (Z20 MHS) Total Design & Procurement Cost #85,000 Escalation (Esc) Factor X Total D&P Cost ___ = Total Esc D&P Cost

Lead Engineer W. B. HARRIS a

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PART 4A CONSTRUCTION OR IMPLEMENTATION SCHEDULE

1J/EGI NO. 32/6

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PART 48 - ESTIMATE OF TOTAL T & L DIRECT MANPOWER REQUIREMENTS

(4) TOTAL COST BASED ON CONSTRUCTION HIDPOINT IN FY 19. . .

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EN DES-EP 4.40 Attachment No. 1 Page 6 of 7

			I	J/ECH NO. IJ NO. DCR NO.	12/0	•
PART &C - MATERIAL & EQUIPMENT	COSTS (VALUE	S ARE CONCE	PTUAL ESTIM	ates)		
: Material Description	Est Qty	Unit Cost	Est Cost	Appi Date 1		

Material Description Qty Cost Cost Date Reg'd

No MAT'L RCO'D

TOTAL COST \$0

ESCALATION FACTOR ______
TOTAL ESCALATION COST:

W.B. HARRIS J-14-82
Estimator Date

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EN DES-L/ 4.40 Attachment No. 1 Page 7 of 7
13/BCH NO. 32.10
IJ NO
DCR NO.

PART 5 - TOTAL OEDC COST SUMMARY

(project)	
(description)	· ·
• • •	
TRADES & LABOR DIRECT COSTS (PART 4B)	\$
MATERIAL & EQUIPMENT COSTS (PART LC)	
CONSTRUCTION EQUIPMENT OPERATION AND OTHER COSTS	
CONSTRUCTION FACILITIES	
TOTAL DIRECT CONSTRUCTION	
FIELD GENERAL EXPENSE	
CONSTRUCTION CONTINGENCY	
TOTAL FIELD CONSTRUCTION	0
DESIGN & PROCUREMENT (PART 3-C)	\$ 85,000
OEDC MANAGER'S OFFICE	
TOTAL OEDC COST 1	\$ 85,000

TOTAL OEDC COST BASED ON MIDPOINT CONSTRUCTION IN FY 19__, EXCLUDES OTHER TVA ORGANIZATIONS AND INTEREST.

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Additional Information:

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Chief, Civil Engineering Branch, W9D224 C-K Chief, Mechanical Engineering & Design Branch, 102SPT-K				7 C-K						

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 32/0

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TVA 10675E (EN DES-7-79)

ENGINEERING CHANGE NOTICE NO. 37/0

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO.

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TVA 10578E (EN DES-7-79)

ENGINEERING CHANGE NOTICE NO. 33/ A

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO.

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TVA 10575E (EN DES-7-79)

ENGINEERING, CHANGE NOTICE NO. 3210

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO.

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TVA 10575E (EN DES-7-79) ENGINEERING CHANGE NOTICE NO. 32/0 TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN DATA SHEET NO.___ ISSUE DATE VNIT DRAWING OR DW NUMBER - 03B - 75 - 76 - 77 901 8-25-82 LOAD CHE - 78 - 79 - 80 705 - 21 703 8-25-lz 204 - 82 - 03B -83 20 12-15-82 9-17-82 NEW SUPPORT HORE BEED 47A427-2-31 RO 12-15-82 9-16-82 NEW SUPPORT WEEK BEAD 47A427 - 6 - 1

TVA 10575E (EN DES-7-79)

ENGINEERING CHANGE NOTICE NO. 3210

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO.

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TVA 10575E (EN DES-7-79) ENGINEERING CHANGE NOTICE NO. 3210 TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN DATA SHEET NO.____ HOVE DATE PRIT DWG REY ACTUAL EXPECTED DRAWING OR BAN NUMBER CONST. WORK READ 702 9-17-4 12-15-12 1- 936-39 LOAD CHANGE 1-034-440 903 703 - 441 901 -442 902 -443 904 -444 -445 9.3 CONST. WORK RED'D -446 904 CONST. WORK RED'D 903 -447 LOAD CHANGE. 902 - 449 CONST. WORK RED'D 450 903 SUPPORT BELETED REDE -451 905 DOCUMENT CHANGE 902 - 452 -453 904 - 454 903 CONST. WOLK. RED'A 404 -455 LOAD CHANGE 903 _ 456 -457 901 -458 902 - 459 902 9-17-82 PROB # 1- 03A- 468 90/ · And its 904 -470 903 1-034-471 3-31-21 CONTENT WORK POOR PRODOT CE 474401-8-1A 1-50.62 9-16-82 9-16-52 47A421-6-M 8/13/23 15mutaic 903 9-30-83 923 B 02-05 1-034-360 474401-212 038 21 AFW 2120 J **ETTIMUTE** 150

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ENGINEERING CHANGE NOTICE NO. _82/0

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO._____

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Field Materials as follows:

Additional Information:

TVA 10675A (EN DES-2-83)

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Chief, Architectural Design Branch, W4C126 C-K Chief, Civil Engineering Branch, W9D224 C-K Chief, Civil Engineering & Design Branch, W3C126 C-K

Chief, Electrical Engineering & Design Branch, W2D224 C-K Chief, Mechanical Engineering & Design Branch, 102SPT-K MEDS, E4837 C-K TVA 10575A (EN DES-6-7

TVA 10575A (EN DES-4-79)

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 22/0_ DATA SHEET NO. __2___

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DATA SHEET NO. 2

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TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

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EVA 10470C (AN 000-1041) ENGINEERING CHANGE NOTICE **COVER SHEET**

'82 04 07 517 (BEFORE ISSUANCE OF OPERATING LICENSE)

TENNESSEE VALLEY AUTHOR IVISION OF ENGINEERING DE		ECN	no. <u>3306</u>
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Chief, Mechanical Engineering Branch, W7C126 C-K
Chief, Mechanical Engineering & Design Branch, 102 SPT-K
Chief, Quality Assurance Branch, W11C126 C-K
Manager of Construction, E7824 C-K
Chief, Cost Renning and Control Staff, W12C74 C-K
Plant Superintendent

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Memorandum

DES Attachment 1 steet 10/6

TENNESSEE VALLEY AUTHORITY

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M. N. Sprouse, Manager of Engineering Design, W11A9 C-K

TROM : J. R. Calhoun, Director of Nuclear Power, 1750 CST2-C

DATE : August 20, 1980

SUBJECT: SEQUOYAH NUCLEAR PLANT - DESIGN CHANGE REQUEST NO. SQ-DCR-837

Please process the attached change request SQ-DCR-837 in accordance with N-OQAM, Part II, Section 3.2.

CR 6813

Category

A (X) NRC commitment, nuclear safety, or EPA requirement

WPT 9-2-80

- B () Availability, capacity, and reliability improvement
- C () ALARA and safety (industrial)
- D () Improved maintenance and operational efficiency
- E () Convenience item

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TGC: JR: DEM: BEA

 ${\tt Attachment}$

cc (Attachment):

ARMS, 823 EB-C

- J. M. Ballentine, Sequoyah
- R. J. Johnson, Power Operations Training Center
- C. C. Mason, Watts Bar Nuclear
- L. M. Mills, 400 CST2-C
- B. F. Roberts, 417 UBB-C

G. G. Stack, CONST, Sequoyah

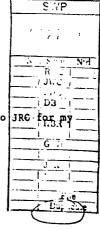
8/21/80 - RMP:SH

cc (Attachment):

R. W. Cantrell, 204 GB-K (2)----Please handle and reply to JRC for my signature.--MNS

G. F. Dilworth, W10C126 C-K

MEDS, 14937 C-K





•	ATT Pag	P 19 - Part III ACHMENT 6 e 1 of 1	A+I 1	hut 2 of
₽ [™]	DESIGN CHANGE	REQUEST		
	19	130/30	8/18/80	
Sequoyah Nuclear Plan	• •	- <u>Y</u> 2/ Date	fark Brock	
Originating Section E Outstanding Work Item		Originator		
Component W-2 Sv	vitches	•		
	Redesign the control			
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	ty switches listed on t		•	
Reason for Request:	To comply with I.E. Bu	illetin 80-20		
				
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/_/ Preliminary E	N DES scoping work to	he done under Tob	Onden No	
This modification	tion is to be capitali	zed under		
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			√/A	
	-	Outage Section		Date
/ This is a non-s approval is give	safety-related modification to begin modification	lon.		
Work completed;	transmit to EN DES for	riant S r drawing revision	uperintendent n only.	Date
				<i>i</i> .
	•	Outage D	irector	Date
/ This modification processing.	on is safety related of	or is to be trans	mitted to EN D	ES for
Approved for tra	insmittal to Chief, NUC		Superintendent	> 1 8/19/80
Approved for tra	insmittal to EN DES.	XX.	5.000	-18/20/5
*Only filled out if under		Director of	Nuclear Power	Pate

AH 1 shut 3 of 6

COST ESTIMATE

	UNIT 1	UNIT 0	TOTAL
LABOR	1000.00	\$ 400.00	1400.60
MATERIAL	16000.00	2000.00	18000.00
FIELD ENGINEERING	3000.00	500.00	3500.00
DESICH ENGINEERING	15000.00	2000.00	17000.00
TUTAI.	\$35000.00	8500.00	\$43500.00

Alternative Considered:

NRC Commitment no alternative

Cost Benefit Analysis:

NRC commitment no analysis

AH 1 shut 4 of 6

			4
Switch	Contact Development Drawing Sheet No.	Drowing	Schematic Drawing No.
11S-1-4A	219	1643-3,9	601-5,6,7 🎋
1-HS-1-11A	84	1643-4	601-7 -4
1-HS-1-22A	84	1643-4	601-7 ^X
1-85-1-29A	84	1643-4	601-7 -× -
3-113A	119	1643-4	765-6
128A	119	1643-9	765-6
30-38A	149	1648-3	779-5
39A	149	1648-5	779-5
74A	54	1648-3	779-3
75A	54	1648-5	779-3
77A	54	1648-3	779-3
78A	54	1643-5	779-3
8CA	54	• 1648÷5	779-3
83A	54 .	1684-3	779-3
88A	54	1648-3	779-3
92A	54	1648-5	779-3
146A	249	1648-3	779-20
157A	249	1648-5	- 779-20
31A-8A	213	1648-3	779-21
16A	213	1649-3	779-21
108A	168	1648-3	779-21
109A	168	1645-5	779-21

50-DCR-P-837 AH 1 Shut 5 of 6

Switch	Contact Development Drawing Sheet No.	Drawing	Schematic No.
31C-303A	253	16 48-3	779-32
338A	253	1648-5	779-32
57-46A	133	1659-1	765-2
73A	133	1659-2.	765-2
HS-62-104A	18	1644-6	779-25, 765-5
108A	18	1644-6	779-25, 765-5
132A	19	1644-6	779-11, 12
133A	19	1644-6	779-11, 12
135A	19	1644-6	779-11, 12
136a	19	1644-6	779-11, 12
63-10A	22	1645-4	765-14
15A	22	1649-9	765-14
65-23A	254	1660-12	779-20
42A	254	1660-11	779-20
81	8	1660-12	657-5
83	8	1660-14	- 665-2
67-432A	142	1660-5	765-15
436A	· 142	1660-5	765-15
440A	142	1660-7	765-15
4441	142 ·	1660-7	765-15
452A	142	1660-7	765-15

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50-0CR-P-837 Att 1 sheet 6 0 16

Ć.	Switch	Contact Development Drawing Sheet No.	Drawing	Schematic No.
	. 456A	142	1660-7	765-15
	460A	142	1660-5	765-15
	464A	142	1660-5	765-15
	68-341A	220	1643-4	765-10
	341D	220	1643-9	765-10
	70-33A	146	1660-14	779-2,5
	38A	146	1660-14	779-2,5
	46A	146	1660-11	779-2,5
	1-HS-70-51A	146	1660-11	779-2,5
	2-HS-70-51A	1,46	1660-11	779-2,5
	2-IIS-70-59A	146	1660-11	779-2,5
	1-HS-70-130A	246	1660-14	779-31
	1-HS-70-131A	246	1660-12	779-31
	1-HS-72-10A	102	1645-9	. 765-7
	27A	102	1645-4	765-7
	HS-74-10A	36	1645-4	765-13
	. 20A	36	1645-9	765-13

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UNITED STATES

NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENTORCEMENT
WASHINGTON, D.C. 20555

SSINS No.: 6520 Accession No.: 8006196023

July 31, 1980

LE Bulletin No. 80-20

FAITLETS OF WASTINGHOUSE TYPE W-2 SPRINGLREQUEN TO NEUTRAL CONTROL SWITCHES

By letter dated June 18, 1980, Commonwealth Edison Corporal submitted Licensee Event Report No. LER 50-295/80-24 to the NRC describing a malfunction of a Westinghouse Type W-2 control switch at the Zion Generating Station, Unit 1. The malfunctioning switch is a three position spring return to neutral switch. Although the switch was in its proper neutral position when it malfunctioned, its neutral contacts failed to close properly thereby preventing the automatic start of 1A Service Water Pump.

Folloquent tests conducted on the malfunctioning switch revealed that contact of open was intermittent with the switch in the neutral (or "Anio fitual") antica. Other tests conducted on identical switches from spaces and from that 2 equipment disclosed two additional switches with a tendency for integrational fundance of the content for the content of the content

A review of this matter by Westinghouse led to the issuance of NSD Technical Pulletin No. NSD-TB-80-9 to the utility expers of all Westinghouse operating plants. The recommendations contained in the Westinghouse technical bulletin include: (i) testing the neutral position contacts of the subject W-2 switches for continuity, and (ii) rewiring of the indicating light circuit to permit the early detection of a neutral contact failure as shown in Figure 1.

Regarding in how the indicating light circuit is wired, loss of continuity then the mentral position contact of a W-2 switch could remain undetected until the equipment associated with the switch were called upon to operate. Since such a failure would be equivalent to by-passing the system associated with the switch, consideration should be given to rewiring the switches used in safety-related applications as shown in Figure 1. Such rewiring would provide an acceptable means for detecting contact failure, provided the indicating light is in the control room and readily visible by the operator. If the indicating light is not so located, consideration should be given to annunciating the neutral position contact failures at the control room to alert the operator of the inoperable status of a safety-related system. In addition, consideration should be given to adding redundant contacts to the W-2 switches or to replacing the W-2 switches with others having a more positive contact wiping action.

ACTIONS TO BE TAKEN BY LICENSEES AND HOLDERS OF CONSTRUCTION PERMITS:

Determine whether Westinghouse Type W-2 control switches with spring return to neutral position are used in safety-related applications at your facility. If so, identify the safety-related systems using these

E Filletin No. 80-20 July 31, 1920 Page 2 of 2 switches and the total number of switches counsed. If no such switches are used in your facility, you should indicate that this is the case and ignore the remaining questions. Licensees of operating plants using Type W-2 spring return to neutral control switches in safety-related applications shall perform continuity tests on all such switches. These tests shall be performed with the switch operator in the neutral position and completed within ten (10) days of the date of this bulletin. In addition, this continuity test shall be repeated at least every thirty one (31) days after the initial test and after each manipulation of the switch from its neutral position. These continuity tests may be discontinued subsequent to implementing the longer term corrective measures described below. licensees of operating plants and holders of construction permiss shall describe the lenger term corrective measures planned and the date by which such measures will be implemented by actual installation or by design change, as appropriate. As a minimum, the longer term corrective measures should include rewiring the indicating light as shown in Figure I provided the light is readily visible to the control room operator. If not, failures of the neutral position contacts should be annumicated in the control room. A reject addressing the above matters, including the number of failures detected during the first series of tests and the safety related systems involved, shall be submitted to the director of the appropriate NRC regional office within forty-five (45) days of the date of this bulletin. A copy of the report shall be forwarded to the Director, Division of Reactor Operations Inspection, Office of Inspection and Enforcement, Nuclear Regulatory Commission, Washington, D. C. 20555. Approved by GAO, B180225 (R0072); clearance expires 7/31/80. Approved was given moder a blanket clearance specifically for identified generic problems. Enclesure: Figure 1

Service Division

Technical Bulletin

An of the representation of a recent technical development perfaming to the installation or operation of Westinghouse republed Nuclearies and operation of Recipients should evaluate the information and recommendation, and initiate action where appropriates

P.O. Box 2773 Par Sough PA 15740

Confection and a series of the			
W-2 Switches (with spring return to neutral)	NSO 18	-80- 9 (3e v.	1
Clectrical Control Autorical Plants	Male	2/16/81	•
All Sites Patraces	S D (s)	: :85	
"SD IB-73-26, & initial issue of this bulletin, dated 7/19/PH	Shet	01	

FACE - 1 NO INFORMATION

During withly operational testing of the safeguards system at an operating nuclear plant, intermittent W-2 switch operation was discovered in the neutral (auto) position. Inserting tions revealed that the intermittent operation resulted when the switch is returned from the eleven or one o'clock position to the neutral (auto) position. The marker was reported to the Nuclear Regulatory Commission on June 18, 1980. At the same tipe, the initial issue of this Bulletin presented preliminary Westinghouse recommendation.

W Switchgear Division, the manufacturer, has completed a thorough evaluation of the W-2 switch with spring return to neutral (auto), and concluded that no generic failure sechanism exists. This conclusion has been confirmed by independent tests at the W more than Laboratories. The intermittent contact closure reported above was a random occurrence. The RECOMMENDED ACTION previously provided by Westinghouse in the initial issue of this Bulletin is modified as indicated below. These actions meet the minic member of the provided by NRC Bulletin 80-20 of July 31, 1980.

PER THE WED ACTION

- 1. All plants should test all safety-related contacts of the W-2 switches (with special return to neutral position) in the neutral position.
- 2. These tests should be repeated following each subsequent use (rewoval from the neutral position) of the switch, and should be done either at normal operating voltage at the contacts, or at least 24 VDC.

W. H. Furfari

Electric Service

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Service Division

Technical Bulletin

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NSC-TB-80-9 (Rev. 1)

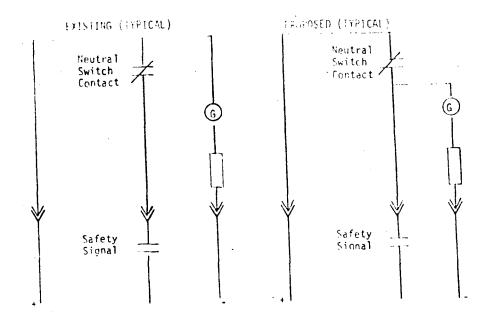
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As an alternative to those periodic tests, a personent recolution of any tendencies to intermittent contact continuity is to wice the existing breaker green light indicator in series with the residual position rafety-related bricks (See Sketch). In those instances where no indicating lights switch contacts (See Sketch). In those instances where no indicating lights exist, a lamp drawing a mini um of 40 milliamperes 0.0. About the added.

This current provides for breakdown of contact film contaminants (fritting) to that no safety circuit relaving on contact continuity can fall into a degraded condition. Green light indication will now confirm closure of the safety-related witch contacts, and this indication should be checked after each switch operation.



ENGINEERING CHANGE NOTICE 183 0214 505

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UNITED STATES GOVERNMENT

Memorandum

ATTACHYEST OF E

TENNESSEE VALLEY AUTHORITY
SWP '82 1222 174

- H. J. Green, Director of Nuclear Power, 1750 CST2-C

FROM . M. N. Sprouse, Manager of Engineering Design, W11A9 C-K

DATE : December 22, 1982

SUBJECT. WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - CONTAINMENT ISOLATION OF

SECONDARY CHEMICAL FEEDLINES

Reference: Your memo to me dated December 2, 1982 (DES 821203 020)

The secondary chemical feedlines will be removed from the four main feedwater lines, the four feedwater bypass lines, and two auxiliary feedwater lines and connected to the steam generator layup recirculation system as recommended in the referenced memo.

This change will be made on ECN 3507 and will meet all the requirements of GDC 57 of 100FR50 Appendix A.

M. N. Sprouse

JCS:JTB:CSB

cc: J. P. Darling, 546 CST2-C

MEDS, WSB63 C-K

H. H. Mull, E7824 C-K

R. M. Pierce, 104 ESTA-K

J. C. Standifer, 204 GB-K

G. Wadewitz, Watts Bar Nüclear CONST (3)

Principally prepared by: J. T. Baxter, extension 3617

Alexander

H. N. Sproude, "Longer of regar

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123 E.

MAMAGER CITIES

FROM

H. J. Green, Director of Nuclear Brian, 1770 CCT2-C

DATE :

December 2, 1982

SUBJECT:

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - CONTAINMENT ISCLALL. SECONDARY CHENICAL FEED LINES

(23:20:22 co8) /2:

Reference: My memorandum to y lives Orotember 21, 1981

The referenced memorandum districts NOT INto recommendations of media GDC 57 of 10 CFR 50 appendix A for into a control coemical feed into a linear transformation was sent, the decision run for made to resolve this problem.

If through the new steam generator reservation modifications.

The new modifications will remove the secondary chemical feed lines to the four main feedwater lines, the four feedwater bypass lines, and two auxiliary feedwater lines. The premical feed lines will true be connected to the steam generator layup recipilation system. This modification has been discussed with John Bayten of the steam of the st

J.A.Com

Chicocz:RIE:ClF

ESE NUCEFF AFIT. 1520 CCT2-1

S. T. Cottle, MUC PR, Watts Ba-

#36 EX

This was prepared principally by F. I. Eric'sson/2 1/3-62

ASRETT.SM

12/3/82 - DBB:SB

cc: MEDS, W5B63 C-K

R. M. Pierce, 104 ESTA-K

J. C. Standifer, 204 GB-K - Please handle. -- HGES

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TERMESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2507. DATA SHEET NO.

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Revisions by this section will not require additional material

Revisions by this section will require additional materials as listed below

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ENGINEERING CHANGE NOTICE NO. 3507

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ENGINEERING CHANGE NOTICE COVER SHEET SWP 183 0314 506

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APPLICANT: Ten

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Tennessee Valley Authority

FACILITY:

Watts Bar Nuclear Plant, Units 1 and 2

SUBURUT:

SUMMARY OF SEPTEMBER 17, 1982, MEETING TO DISCUSS THE INDEPENDENT DESIGN VERIFICATION FOR THE WATTS

SAR NUCLEAR PLANT, UNITS 1 AND 2

Representatives of the NRC staff and TVA met on September 17, 1982, in Bethesda, Maryland to discuss the applicant's plans to perform an independent design verification (10V) of the auxiliary feedwater system at the Watts Bar Nuclear Plant. Attendees are listed in Enclosure (1).

Buring the meeting and by letter dated September 9, 1982, TVA committed to have an interpretent contractor (Black and Veatch) perform a design and construction review of the Matts Bar auxiliary feedwater system. TVA intends to take this stallation and compile it with broader, more comprehensive programmatic reviews to confirm their position that Watts Bar is built in accordance with design and construction requirements, and in accordance with the licensing application.

The presentation by TVA consisted of a statement of the scope and objectives of the purisw, the basis for the selection of the auxiliary feedwater (AFW) system, a refinition of the boundaries of the AFWS to be included in the review, the basis for selection of Black and Veatch, and the proposed schedule. A copy of the pre-

Flack and Veaton is expected to begin the review the week of September 20, 1982, and should be finished by the end of December 1982, at which time a copy will be submitted to the NRC. TVA will then submit their evaluation shortly thereafter.

Thomas J. Keryoni, Project Manager Licensing Branch No. 4

Division of Licensing

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DIVERDIT OF ELICIMETERING DESIGN NONCONFORMANCE REPORT

MEDS to sor to

ATTACHMENT 5

- DATES BAS DE LEIZ PLANT

FRETHER CHIMANIATAN MANE P. L. EDECK MINISTER OF

DESCRIPTION OF CONDITION

Various supports on the auxiliary fordunter system have not been modified, recosigned, or initially designed per revised analysis under ECN 2576.

The above condition represents a situation which, if it had not been detected, may he resulted in the imbility of pipe supports to accomplish their safety function. These discrepancies were identified during Black & Veatch review on findings F369, F371, F719, F767, F781, F784, F784, F784, F845, F843, F853, F853, F869, F911, F949, F950, F951, F955, F962, F961, and F963.

MIDS Action on the

APER CROANLISTICS DATE

DESCRIPTION OF CONDITION

Buy anchors 47A150-3-8 and 47A060-3-10 fail to meet the stiffnass requirements for the force in the z-direction as required by Design Criteria WB-E0-40-31.1 section 7. A Revision 1 of 47A060-3-8 allows 25.3 percond and revision 2 of 47A060-3-10 allows 43.3 percent of the load in the z-direction, applied on one side of the anchor, the to effect through the anchor to the other side. Section 7.1.4 of the design critical limits a load transferred through anchor to 10 percent.

1.15.5

NUL STOUMER - ICE HERUM T REPORT NO. WARRIE 195 WATTS BAR NUCLEAR PLANT PREPARER/ORGANIZATION/DATE R. L. Ilich/SWP/January 10, 1983 DESCRIPTION OF CONDITION The design for support O3B-IAFW-R188 Rev 901 will not allow for a secure tightening of the U-bolt and will therefore not allow for adequate restraint. This deficiency was identified during Black & Veatch Review on finding 1775. 3 SIGNIFICANT CONDITION ADVERSE TO QUALITY TO DATE OF OCCURRENCE EST (XI, ACT) December 1978 YES K METHOR OF DISCOVERY Black & Veatch Review 1/10/83 UNID CODE IEN CES-EP 8.011 CURRECTIVE ACTION. HE ACTION DEVIATES FROM & DESIGN CRITERIA REQUIREMENT JESION CRITERIA DOCUMENT NO EXCEPTION REQUEST NO CN NO ECN REQUIRED SCHEDULE IMPACT

Number of the state of the stat SWP '83 U110 125 T REPORT NO B: 5 P 827 3 UNIT 1 Watts Bar Nuclear Plant J. R. Holloway/SWP/January 10, 1983 PREPAREN/ORGANIZATION/DATE DESCRIPTION OF CONDITION Support 03B-1AFW-R221 Rev 903 was not designed to the specified requirements of support oads table 478427-469 RO. The support should be allowed to move thermally in the X and Z directions and be restrained in the Y direction. However, the support is restrained by a U-bolt in the X and Y directions and will not allow the required movement. This deficiency was identified during Black and Veatch review on finding F365. 9 SIGNIFICANT CONDITION ADVERSE TO QUALITY TATE OF OCCURRENCE EST (x), ACT (4/21/82 YES IX METHOD OF DISCOVERY Black and Veatch Review 101 BRANCH CHJEF/DATE 1/10/8 DE (EN DES EP 8.01) JARECTIVE ACTION LURRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT VES. EXCEPTION REQUEST NO DESIGN CRITERIA DOCUMENT NO. SE SCHEOUSE WPAGE ELN REQUIRED

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PLANT SUPERINTENDENT CONSTRUCTION PROJECT MANAGER MEDG, 18063 C-II ADMG, 440 COTY-C

CHIEF, COST PLANSING AND CONTROL STAFF, WARRING C-E CHIEF, ANCHITECTURAL SEPTRAT SHARCH, WALLES C-E CHIEF, CIVIL EMBINEERING SHARCH, MARCHES C-E CHIEF, ELECTRICAL EMBINEERING SHARCH, WESTER C-E CHIEF, SPECIAL DESIGN PROJECTS, WESTER C-E TERMESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 35!

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| AFFECTED | DAAWING ON BAN MUNICER | erre<br>NEV. | 100VE<br>007100VKS | DATE                 |             | REMARKS PROJECT | 7          |
|----------|------------------------|--------------|--------------------|----------------------|-------------|-----------------|------------|
| 3,41     | 1                      |              | 44 45 99           | mn/2                 | 7/3         |                 | $\sqcup$   |
| 1        | 47W427-201             | 6            | 2-20-03            | 2463                 |             | N3-3-4A         | $\Box$     |
| 1 2      | 474427-207             | 5            | 5-3083             | 4.28-83              | <u> </u>    | N3-3-13A, 145   | Ш          |
|          | 473 427 - 380          | 3            |                    |                      |             | N3-3-13 A       | Ш          |
|          | -383                   | 3            |                    |                      | ·           | N3-3-14A        | Ш          |
|          | -313                   | 5            |                    | 1                    |             | N3-3-14A        | $\Box$     |
|          | 47W427-219             |              | V                  | 4-28-83              |             | 05-02           | -          |
| 1+3      | 47 4 427-206           | 5            | 7-30.83            | 1-27-83              |             | N3-3-1A,2A      | 7          |
|          | 478 427.512            | I            |                    | 7-27-83              |             |                 | لعا        |
|          | - 478                  | 2            |                    |                      |             |                 | a          |
| +        | -513                   |              |                    |                      |             | 1               | a          |
| I        | 474427-203             | 5            |                    |                      | L,          | N3-3-10A:12A    | 2          |
| ي        | - aos                  | 6            |                    |                      |             | N3-3-9A         | a          |
|          | -200                   | 6            |                    |                      |             | N3 - 3 - 3 A    | a          |
|          | - aoa                  | 7            | <u> </u>           | 1.27.83              |             | N3-3-11A        | a          |
| - 2      | Unit 2 est 6           |              | 12:30:64           | DELETE<br>TOC INMINI |             | <u> </u>        | 137        |
|          | 47W427-201             | 7            | 8-30-83            | 8-29-83              |             | N3-3-4A         |            |
|          | 478427-475             | 2            |                    | 8-29-85              |             |                 | 1          |
|          | 468                    | 2            |                    |                      |             |                 | $\coprod$  |
| 142      | 484                    |              |                    | 8-27-6               | \$          | V               | $\prod$    |
| 1+2      | 47W401-212             | 2            |                    | 9-12-83              |             | 200-02-05       | $\prod$    |
|          | 478401-408             | /            |                    | 9-12-83              | <u>'</u>    |                 | 11         |
|          | 410                    | 1            |                    | 9-12-83              | <del></del> |                 | Щ          |
| V        | V 409                  | L            |                    | 9-12-83              |             |                 | $\prod$    |
|          | 418427 - 313           | 4            |                    | 9-12-83              |             | N3-3-3A         | 1          |
| 2        | V 4/2                  |              | 12-30-83           | DELETE<br>Jac 1944   | +==         | N3-3 15A 5      | 7          |
| 1+2      | 478401-421             |              | V                  | 9-12-03              |             | 200-02-05       | 14         |
| 1\$2     | 47W427- 207            | 7            | 10-28-83           | 10.3.83              | <u></u>     | N3-3-13A, 14A   | 15         |
|          | 47W427-203             | lo           |                    |                      | <u></u>     | N3-3-10A, 12A   | 11         |
|          | 478427-379             | 3            | 1                  |                      |             | N3-3-12A        | 1          |
|          | -378                   | 5            |                    |                      |             | 1               | $\prod$    |
|          | -376                   | S            |                    |                      | <u> </u>    | N3-3-10A        | 1          |
|          | -375                   | 5            |                    | V                    |             |                 | . 4        |
| 1\$2     | 47W427 - 206           | 6            |                    | 10-12-13             | 1           | N3-3-/A,2A      | <b>—</b> — |
| 1        | - 202                  | Ĵ            |                    | 10:3:43              |             | N3-3-1/A        | 5          |
| 7        | 4713427 - 377          | 1            |                    | 10.3.63              |             | T               | J          |

TVA 10975E (EN 069-7-79)

### ENGINEERING CHANGE NOTICE NO. 3 5//

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO.

PAGE [7]

|                |                             | Γ_                                               | taque          | DATE                                   | LINE UPDAT                            | 10        |
|----------------|-----------------------------|--------------------------------------------------|----------------|----------------------------------------|---------------------------------------|-----------|
| ACTED          | DRAWING OR SM NUMBER        | REY.                                             | EXPECTED       | ACTUAL                                 | REMARKS REV. NO.                      | 1         |
|                | <b>+</b> 73 <b>+</b> 27-383 | 4                                                | 10-28-63       | 10.3.83                                | N3-3-/1A                              | 5         |
|                | 47W427 - 200                | 1                                                | 1              | 10313                                  | N3-3-3A                               |           |
|                | 478427-380                  | 4                                                |                |                                        |                                       |           |
|                | -382                        | 4                                                |                |                                        |                                       |           |
|                | - 374                       | 3                                                |                | J                                      | <i>\\</i>                             |           |
|                | 4 7W427- 201                | 8                                                |                | 10-3-83                                | N3-3-4A                               |           |
| 1              | 478427-38/                  | 5                                                | 1              |                                        | 1                                     | L         |
| 1              | 47W427-22/                  |                                                  | 10-28-83       |                                        | N3-3-5A                               | 5         |
| $\overline{I}$ | -220                        | 2                                                |                |                                        |                                       | Ш         |
| 1              | 478927-522                  | 1                                                |                |                                        |                                       | $\coprod$ |
| 1              | -523                        | 1                                                |                |                                        | _ J                                   | k         |
| 122            | 47W427 206                  |                                                  | ग्रना-७३       | DELETE<br>JRC mball                    | N3 3-14,24                            | 6         |
| 1              | 47B427-470                  | 2                                                | 11-30-83       | 10-31-83                               | N3-3-4A                               | 8         |
| 1 \$ 2         | V - 5/3                     | 12                                               | 1              | <u>u</u>                               | N3-3-1A,-ZA                           | *         |
| 1              | 47W427 - 200                | 9                                                | 12 20 23       | 1-1084                                 | N3-3-3A                               | 9         |
|                | 47W427 - 201                | 9                                                |                | DELETE                                 | N3 -3 - 4A                            | Щ.        |
|                | -2/2                        |                                                  |                | Let ninter                             |                                       |           |
|                | 47W427 - 202                | 9                                                | <u> </u>       | 1-10-14<br>DELETE                      | N3-3-1/A                              | $\coprod$ |
|                | 215                         | 4                                                |                | AR assets                              |                                       |           |
| 142            | 47W427-207                  | 9                                                | <del>  Y</del> | DELETE                                 | N3-3-13A,-14A                         | Y         |
| ļ              |                             |                                                  |                | Jec                                    | N3-3-//A                              | *         |
| 1              | 47W427-227                  | <del>                                     </del> | 1-31-84        | 1-31-84                                | N3-3-10A                              | 10        |
|                | 471427-228                  | μ_                                               | 1-31-84        | \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | N3-3-124                              | *         |
|                |                             | -                                                |                |                                        |                                       | $\vdash$  |
| ·              |                             | _                                                | <b></b>        |                                        |                                       | $\vdash$  |
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| ·              |                             | <del>                                     </del> |                | <b>†</b>                               | · · · · · · · · · · · · · · · · · · · |           |
|                |                             |                                                  |                |                                        |                                       |           |
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| L              | -                           | 1                                                | L              | <del></del>                            | 1                                     |           |

TVA 10579E (EN DES-7-79) ENGINEERING CHANGE NOTICE NO. 35// TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN DATA SHEET NO. ISSUE DATE PPECTED OWG EXPECTED ACTUAL REMARKS DRAWING OR SYM NUMBER

AUXILLEY \_\_ - AUXILIARY FEROMATER - 3B Revul ons by this rection will estains a litterful rate JEM End

| Free                                  |            | in fre         | oct Na     | Negar S'    | WP 20        | 4 CAK        |                     |              |           | Retes      | <b>100</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | T           | A.A                 | our        | 4-671                                 |
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| 700                                   | ering Sec  | tion<br>C.R.   | 41         |             | E            | I            |                     | A Additional |           | 10         | H                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             | , 10 p <b>V</b> .27 | ·····      |                                       |
| 700                                   |            |                |            |             |              | WP           | 83                  | 031          | 4 50      | 90         | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                     |            |                                       |
| yı                                    |            |                | HIL        | T/E7.       | <u> </u>     | WOO          | 10                  | 2020         |           |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                     |            |                                       |
| octi                                  | i Pages (i |                | 7          | 1 7         |              | MRI          | <u>8</u>            | 30713        | 5         | 18         | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                     |            |                                       |
| iupo<br>kaff                          | Eng. or    | M.             | 74         | AAA.        | <b>.</b>     |              |                     |              |           |            | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                     |            |                                       |
|                                       | Mecti      | <u>~//</u>     | <u> </u>   |             | <sup>2</sup> |              |                     | <del></del>  |           |            | Η.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             | ~                   |            |                                       |
| tood                                  | i F        | 1.40           | MAY        | 84          | 3            |              |                     |              |           |            | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                     |            |                                       |
| iran<br>hiel                          |            |                |            |             | Gito.        | L            |                     | * *          |           |            | 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             |                     |            | · · · · · · · · · · · · · · · · · · · |
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|                                       |            |                |            |             |              |              |                     |              |           |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                     |            |                                       |
| /ste                                  | em or Fe   | sture          | AL         | XILL        | ART.         | - 1-5        | -yu                 | IA TER       | 7/7       | <u> </u>   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                     |            |                                       |
| efe                                   | rence & f  | Descript       | ion of (   | Change      |              | HALL         | U (                 | DUE 7        | "n QI     | Act        | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | VFM         | 7.4 )               | 10520      | DALUT                                 |
|                                       |            |                |            | -           |              | 12.11.2      |                     |              |           |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                     |            | <u> </u>                              |
| D                                     | EVIE       | /.) <b>s</b>   | FIAID      | 44145       | :            |              |                     |              |           |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                     |            |                                       |
| -44                                   | VIE        | <u> </u>       |            | WY          | L            |              |                     |              |           |            | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                     |            |                                       |
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|                                       |            |                |            | <del></del> |              | A            |                     |              |           | <u>~ .</u> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                     |            | <del></del>                           |
|                                       |            |                |            |             |              |              | 4                   | e e          |           | <b>₹</b>   | heider<br>H                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Lyp         |                     |            |                                       |
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|                                       |            |                |            |             |              |              | TE.                 |              |           |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                     |            |                                       |
|                                       |            |                |            |             |              |              | <b>3</b>            |              |           |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             | )                   |            |                                       |
|                                       |            |                |            |             |              |              | TE.                 |              |           |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             | 3                   |            |                                       |
|                                       |            |                |            |             |              | CT1          | TE<br>OSUR          | E SH. =      |           |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                     | 1          |                                       |
| · · · · · · · · · · · · · · · · · · · |            |                |            |             |              | CLI<br>SEE A | TE<br>OSUR          |              | VINGS LIS | T, REV     | ERSE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | SID€        |                     |            |                                       |
|                                       | DATE       |                |            |             | BAMOI        | CLI<br>SEE A | TE<br>OSUR<br>ISSOC | E SH. =      |           |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | SIDE REVISE | DN DN               | }          |                                       |
|                                       |            | PARED          |            |             |              | SEE A        | TE<br>OSUR<br>SSOC  | E SH. =      | 04        |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             | DN DN               | }          |                                       |
|                                       | ISSUED     | PARED          |            |             |              | SEE A        | TE<br>OSUR<br>SSOC  | SH. =        | 04        | ESCRIPT    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             | DN DN               | }          |                                       |
|                                       | ISSUED     | PARED          |            |             |              | SEE A        | TE<br>OSUR<br>SSOC  | SH. =        | 04        | ESCRIPT    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             | DN DN               | }          |                                       |
|                                       | ISSUED     | PARED          |            |             |              | SEE A        | TE<br>OSUR<br>SSOC  | SH. =        | 04        | ESCRIPT    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             | DN .                | }          |                                       |
|                                       | ISSUED     | PARED          |            |             |              | SEE A        | TE<br>OSUR<br>SSOC  | SH. =        | 04        | ESCRIPT    | 10410                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             | DA .                | }          |                                       |
|                                       | ISSUED     | PARED          |            |             |              | SEE A        | TE<br>OSUR<br>SSOC  | SH. =        | 04        | ESCRIPT    | 10410                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | FREVISK     | DAI                 |            |                                       |
|                                       | ISSUED     | PARED          |            |             |              | SEE A        | TE<br>OSUR<br>SSOC  | SH. =        | 04        | ESCRIPT    | 10410                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | FREVISK     | DA .                |            | TOT/PAGI                              |
|                                       | ISSUED     | PARED          |            |             |              | SEE A        | TE<br>OSUR<br>SSOC  | SH. =        | 04        | ESCRIPT    | 10410                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | FREVISK     | DA .                |            |                                       |
|                                       | ISSUED     | PARED          |            |             |              | SEE A        | TE<br>OSUR<br>SSOC  | SH. =        | 04        | ESCRIPT    | 10410                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | FREVISK     | )<br>)              |            |                                       |
|                                       | 13-13-33   | PARED<br>CAN   | SUPV.      | AL          |              | SEE A        | TE<br>OSUR<br>SSOC  | SH. =        | 04        | ESCRIPT    | 10410                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | FREVISK     | DN DN               |            |                                       |
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|                                       | 1-13-33    | PARED<br>LANGE | Me with 18 | AL          |              | SEE A        | TE<br>OSUR<br>SSOC  | SH. =        | 04        | ESCRIPT    | 10410                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | FREVISK     | DN .                |            |                                       |

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TENNICESEE VALLEY AUTHORITY

## DATA SHEET NO. \_\_\_\_\_

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| AFFECTED    | DRAWING OR SAN MUNISER                 | OWN<br>REV. | EXPESTED     | MATUAL.                                          |                                                  | RESEARCE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPE |            |
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|             | DUL - MARIN                            | +           |              |                                                  |                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | +          |
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|             |                                        | _           | <del> </del> |                                                  |                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1          |
|             |                                        |             | <u> </u>     |                                                  |                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | +          |
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|             |                                        | -           | <del> </del> | <del>                                     </del> | <del>                                     </del> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | _ L        |
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Howard D. Hutchinson B. W. Whither / 4

| Te:<br>From: NPD Project Manager _                                                                               |                                                   |                                       | DATA SHEE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | T NO                                                | -          |                 | PAGE 1      |
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| ring Section                                                                                                     |                                                   |                                       | III (A Accession No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ,                                                   | 1          | W. O. Assess    | en No.      |
| SWP WMG-Z                                                                                                        |                                                   |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                     | WBP        | '84 0 2         | 23 53       |
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| Total Pages (RO): 2                                                                                              |                                                   | WBP '                                 | B3 1′2 <b>0</b> 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 512                                                 | WBP        | 01070           | 4 500       |
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| Reference & Description of Cha                                                                                   | ne CHAN                                           | 48 DUE                                | TO BLAC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | K & VENTE                                           | וסעו א     | PENDENT         | Review      |
|                                                                                                                  |                                                   | <b></b>                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | •                                                   |            |                 |             |
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|                                                                                                                  | GROUPBRANC                                        | CLOCUF<br>SEE ASS                     | SOCIATED DRAW                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                     | SE SIDE    | VISION          | TO          |
| NO. ISSUED PARED SUPV.                                                                                           | HEAD CHIEF                                        | SEE ASS                               | SOCIATED DRAW                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | DESCRIPT                                            | TION OF RE | VISION          | TO          |
| NO. ISSUED PARED SUPV.                                                                                           | HEAD CHIEF                                        | SEE ASS                               | COCIATED DRAW                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | DESCRIPTION OF LANGE                                | TION OF RE | VISION          |             |
| NO. ISSUED PARED SUPV.  B 14/193 RLI SANCE  9 1-9-84 RLE SANCE                                                   | HEAD CHIEF                                        | SEE ASS                               | ADDED D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | DESCRIPT<br>UNIT 1 DO                               | ON OF RE   |                 | PĀ          |
| NO. ISSUED PARED SUPV.  8 12/1/93 RLI (A)  9 1-9-94 RLT (A)  10 2/-14 RLI                                        | HEAD CHIEF                                        | SEE ASS H ECN DO CLERK MGF            | ADDED D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | DESCRIPT<br>UNIT 1 TO<br>WG.                        | ON OF RE   |                 | PĀ          |
| NO. ISSUED PARED SUPV.  8 12/1/93 RLI (M)  9 19-14 RLI (M)  10 2/-14 RLI                                         | HEAD CHIEF                                        | SEE ASS H ECN DP CLERK MGF            | ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED D ADDED | UNIT 1 TO<br>WG.<br>WS. NOS.<br>2 DWGS              | ON OF RE   |                 | PĀ          |
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| NO. ISSUED PARED SUPV.  8 12/1/93 RLI (M)  9 19-14 RLI (M)  10 2/-14 RLI                                         | HEAD CHIEF  NA  NA  NA  NA  NA  NA  NA  NA  NA  N | SEE ASS H ECN DP CLERK MGF            | ADDED TO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | DESCRIPT<br>UNIT 1 70<br>WG.<br>U.S. NOS.<br>2 DWGS | ON OF RE   |                 | PA          |

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ENGINEERING CHANGE NOTICE NO. \_\_\_\_\_ ISSUE DATE EXPECTED ACTUAL APPECTED INIT ---

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| S-DAM GHE                                                                                                                                                            | SWP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             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| 3-29-83 GLP SOM GLA                                                                                                                                                  | BRANCH ECN D.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| 3-29-33 GLP AM CLASS                                                                                                                                                 | MA WA JO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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| 3-29-13-64-0 MM 6-73<br>4-12-13-64-0 MM 6-73<br>8-10-13-64-0 MM 6-73                                                                                                 | MANCH ECN D. 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| 3-29-33-02-0 SUP. HEAD<br>3-29-33-02-0 SUP. HEAD<br>4-12-13-02-0 SUP. HEAD<br>8-10-13-02-0 SUP. HEAD<br>8-10-13-02-0 SUP. HEAD<br>8-15-03 RELEGIO BKID               | MANCH ECN D. CHIEF CLERK MC N/A XX JC N/A XX JC N/A N/A XX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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| 3-29-33 4LP 999 4 75<br>4-10-13 44P 999 4 75<br>8-10-13 44P 999 475<br>8-15-13 RLIST BKID<br>8-23-83 GLP 999 445<br>9-2-13 RLIST 845<br>11-18-83 4LP 999 425         | MANDY EEN D. CHIEF CLERK MO  N/A XX/ JC  N/A M/K JC  N/A M/K JC  N/A M/K JC  N/A M/K JC  N/A M/K JC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ELEMOVED 25  C. 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| 3-29-33 4LP 999 4-75<br>4-12-13 4-P 999 4-75<br>8-10-13 4-P 999 7-75<br>8-15-13 RLIST BKD<br>9-2-13 RLIST BKD<br>9-2-13 RLIST BKD<br>11-18-83 4LP 999 7-75<br>NO. 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| 3-29-33 4LP 999 4 75<br>4-10-13 44P 999 4 75<br>8-10-13 44P 999 475<br>8-15-13 RLIST BKID<br>8-23-83 GLP 999 445<br>9-2-13 RLIST 845<br>11-18-83 4LP 999 425         | MANDY EEN D. CHIEF CLERK MO  N/A XX/ JC  N/A M/K JC  N/A M/K JC  N/A M/K JC  N/A M/K JC  N/A M/K JC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ELEMOVED 25  C. 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TEMPLESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN.

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| 1              | 47W803-2             | 18            | 3-51-83           | 4-12-83 | FSAR Fin | T                     |
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|                | 47W427-4             | 18            |                   | 4-14-B  |          | 790L<br>5053          |
|                | - 5                  | 7             |                   |         |          | F264 morF255          |
|                | 1 -6                 | 17            |                   | V       |          | F775                  |
|                | 038-14FW- RZ         | 904           |                   | 3-24-83 |          | NCR WBHSWP8301 F784   |
|                | 83                   | Ţ             |                   |         |          | 1127014WP8301 F767 3  |
|                | -R11                 | 902           |                   | 3-24-83 |          | YOID DWG F786         |
|                | . 224                |               |                   |         |          | F810                  |
|                | - RZG                | 906           |                   | 3-24-83 |          | NCR WBUSWP8301 F794   |
|                | - R4Z                | 903           |                   | 3-24-83 |          | F707                  |
|                | - 852                |               |                   |         |          | YOU OWG FOR !         |
|                | -865                 |               |                   |         |          | F357 L                |
| $\blacksquare$ | - 457                |               |                   |         |          | F359 /                |
|                | -265                 |               |                   |         |          | F359 /                |
|                | -868                 |               |                   |         | -        | F360                  |
|                | -873                 |               |                   |         |          | F361                  |
| _              | -814                 |               |                   |         |          | F36211                |
|                |                      |               |                   |         |          | F814 I                |
|                | - 891                |               |                   |         |          | WE WENEW 5301 FB46 !  |
|                | - 694                |               |                   |         |          | F937 /                |
|                | -8100                | 903           |                   | 8-10-83 |          | F104                  |
|                | -R116                | 903           |                   | 3-24-83 |          | F751                  |
|                | -8120                |               |                   |         |          | Trea!                 |
|                | 79.85                |               |                   |         |          |                       |
|                | -R180                | 901           |                   | 3.24-83 |          | HER WANSWP 8301 F964  |
|                | - R182               | 903           |                   | 1       |          | HILE WEN SWP8301 F965 |
| •              | - R188               | 903           |                   | 4-8-83  |          | NLE WINISWP8305 F775  |
| _              | -7.557               |               |                   |         |          | VOID DWG F866         |
| 2              | 2/FW-R219            | 902           |                   | 3-24-8  |          | 5112                  |
|                |                      | 904           |                   | 4-8-83  |          | NCR WENDWPOZIZ F365   |
| 2              | ZAFW-RZZ3            | 902           |                   | 8-10-83 |          | HILE WENSWPESOI F783  |
|                | 1AFW - R231          | 902           |                   | 3-24-83 |          | ME 4455R FILE         |
|                | -8236                | 1             |                   |         |          | WE WELEND SSO! TESS!  |
|                | 1 1                  | 903           |                   | 3-24-83 |          | 6370<br>5763          |
| ¥ 1            |                      | $\overline{}$ | V                 | 1       |          |                       |
| <b>V</b>       | 1-038-57             | 902           |                   | 1       |          | F9I9                  |

TERMESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING OCSION.

# DATA SHEET NO. 4-

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| APPECTED    | DOWNING OR BAN NUMBER | 9000<br>MEV. | (20100100 | BATE<br>ASTUAL |                                                  | AGMAAN            | )            | YA SH           |              |
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|             | 1-038-64              | 904          | 3-81-83   |                |                                                  |                   |              | 20              |              |
| - ,         | 47A060-3-1            | Ť            |           | 3-24-83        |                                                  |                   |              | 64              |              |
|             | 47A427- 3-7           | 2            |           | 3-24-83        |                                                  | KE WON SHI        | 8301 FG      | 43              |              |
|             |                       |              |           |                |                                                  | MCM CX            | ·            | 47              | 1            |
|             | - 5-1                 | 0            |           | 3-24-83        |                                                  | NEW D             |              | 4               |              |
|             | - 2-32                | 0            |           | 4-8-83         |                                                  | HEW DW            | Stol F       | 362             |              |
| 4           | 474450-3-67           |              | V         | 3-24-83        |                                                  | NE WON SW         | P8301 F      | 277             |              |
| 1           | 47A060-3-8            | Ž            | 3-31-83   | 9-10-53        |                                                  |                   | E            | 3/8             |              |
|             | 474060- 3-9           |              |           |                |                                                  |                   | £            | 124             | 3            |
|             | 47A060- 3-10          | 3            |           | 8-10-83        |                                                  |                   | F.           | 37A             |              |
|             | 474060-3-11           |              |           |                |                                                  |                   |              | 224             | 3            |
|             | 1-03A-446             | 905          |           | 3-24-83        |                                                  |                   | E            | 864             | Ц            |
|             | 038-INTW-958-         |              |           |                |                                                  | <del>~~~</del>    | ewo P        | 244             | -1           |
|             | 250                   |              |           |                |                                                  |                   |              | <b>945</b>      | $\vdash$     |
|             | -8671                 |              |           |                |                                                  |                   | F            | 27              | _'           |
| <u>- ا</u>  | 269                   |              |           |                | <u> </u>                                         |                   |              | <b>939</b>      | _            |
|             | -265                  |              |           |                |                                                  |                   | £            | 241             | <u>='</u>    |
|             | -Y71                  |              |           |                |                                                  |                   |              | 223             |              |
|             | ¥ ¥ - 275             |              |           |                |                                                  | <u> </u>          |              | <del>931</del>  | Ė            |
| _           | 47A060-3-34           |              |           |                |                                                  | HEN PHE           |              | <del>3/  </del> | 出            |
|             | 474427-1-3            |              |           |                | <u> </u>                                         |                   |              | 949             | 4            |
|             | -7-5                  |              |           |                | <del>                                     </del> |                   | <del>-</del> | <del>96</del> 1 | Ľ.           |
|             | 7-6                   | <u> </u>     |           |                |                                                  |                   | F            | <del>236</del>  | Ė            |
| _           | 3-1                   | <u> </u>     |           |                |                                                  |                   | <u></u>      | 968             | Ė.           |
|             | 8-1                   |              |           |                |                                                  |                   |              | 740             | <u> </u>     |
| <del></del> | Y -8-5                |              | <b>Y</b>  |                | <del>                                     </del> | <del>-1 - 1</del> |              | 933             | ۳            |
| 2           | 038-2AFW-R237         |              |           | 3-24-82        |                                                  | ,                 | F            | 370             |              |
| 1           | 038: JAFW-Y207        |              |           | 3-24-53        |                                                  |                   | <u> </u>     | 756             | <u> '</u>    |
|             | 47A060 - 3 - 3        | 14           | 3-3183    | <b>3</b> -2483 | <del>                                     </del> |                   | <u>k</u> .   | 747             | μ_           |
| 1           | 47A427-5-1A           |              | 3.31-83   |                | 1 .                                              | HEM DM            |              | 868             |              |
|             | 1-038-1               |              | 3.31.83   |                |                                                  | YOLO ON           |              | 848             |              |
|             | 474427-2-33           |              |           | 4-8-83         | 1 1                                              | HEK DW            |              | <u>ev</u>       | $\mathbf{r}$ |
|             | 474427-2-34           |              | 4-8-83    |                |                                                  | HEM OM            | G F          | 881             | 12           |
| . 1         |                       |              | 4443      |                |                                                  |                   |              |                 | 棒            |
| I           | 038-1AFW- R150        | T            | 6-20-83   |                | + - 1                                            |                   |              | 736             | T-           |
| 1_          | 47A427-4-5            | 0            | 8-8-83    | \$10-83        | نـــــــــــــــــــــــــــــــــــــ           | NEW DWG           | F            | 175             | 3            |

| <b>517</b>   | hou or          | CHONN            | E RIFFE        | OCCION                                           | )              |              |               | MMG CHANGE NOTICE N<br>DATA SHEET NO |                                                   |                                                  |
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| To:          | - <del>2</del>  | m Proj           | act Man        | 4007                                             |                |              |               | Retour                               | 5 Dy:                                             |                                                  |
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| Prop         | aring Sat       | net              |                |                                                  |                |              | 14.1          | Addition No.                         | 77.47.2                                           |                                                  |
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TVA 10679E (EN DES-7-79)

### ENGINEERING CHANGE NOTICE NO. 3511

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 4

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|          |                       |          |          | 100/6 | DATE     | LINE UPE<br>DIN GATA | MTED |
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|          | 038-1AFW-R188         | 904      | 8-9      | 13    | PH-13    | VOID DWG             | 3    |
|          | 47A060 - 3-8A         |          | 8-9      |       |          |                      | 3    |
|          | (111333               |          |          |       |          |                      |      |
|          | SERVED 184            | 5        | 100      |       | SURI     | Septent tubes        | 64   |
|          |                       |          |          |       |          |                      |      |
| 1        | ₩ 1-03B-57            | 903      | 3130     | - 63  | 12-683   | MCE 4480E EI         | • 2  |
|          | 1-038-64              | 3h5      |          |       | J/       | NCR 4481P RI         | 5    |
| 1        | 1-03A-375             | 903      | <b>G</b> |       | 9-12-83  | 72-05 47W401-212     | 5    |
|          | 1-034-376             | 903      |          |       | J)       | - UZ                 | 15   |
| 2        | 038-2AFW-R3           | _        | 11-30    | -83   | 12-1-83  | F76                  |      |
| 1        | 038- IAFW-P48         | 904      |          | -     | 12-12-83 | F85                  |      |
| <b>—</b> | 038-1AFW-R49          | 903      |          |       | 12-12-83 | FBS                  |      |
|          | 038-1AFW-R233         | 903      |          |       | 12-1-13  | F74                  |      |
|          | 038-14FW-R207         | 901      |          |       | J        | F75                  | _    |
|          | 038-14FW-VZ07         | 910      |          |       | 11-18-23 | F754                 |      |
|          | 474060-3-34           | 0        |          |       | 12-1-83  | F91                  |      |
| , —      | 038-IAFW-R 99         | 902      |          |       | 12-1-93  | DIN 34 3             |      |
| 1        | 038-1AFW-8230         | 9/13     | J        | _     | 1,       | 0 548                |      |
| 丰        |                       | <i>"</i> |          |       |          | 5.5 5.4              |      |
|          | 47A060 -3 - 34A       | 0        |          |       | 12-193   | F911                 | 8    |
|          | 1 -34B                | 0        |          |       | 1        |                      | 8    |
|          | -346                  | Ö        |          |       |          |                      | 8    |
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| ,        | -34E                  | 0        |          |       |          | ·                    |      |
|          | -34F                  | 0        |          |       | , ,      | <b>↓</b>             | 8    |
| 1        | 038-1AFW- 2045        | _        | 12-0     | 1-13  | 12-12-83 | DIM 3476             |      |
|          | 038-14FW- R130        |          | 7        | į     | 12483    | DIN 3619             | 7    |
| 1        | 414060-3-7            | T        | 7        |       | 1-12-84  |                      | 9    |
| 1        | 41A060-3-5            | Ī        | 1        | -     | 3-15-84  |                      | 9    |
|          | 472060 -3-11          | 3        |          |       | 3684     |                      | G    |
|          | 471060-3-6            | <b> </b> | H        |       |          | DECETE               | 119  |
| i        | 47.4060 - 3-35        | 2        |          |       | 2-3-84   |                      | 9    |
| . 🗂      | 474060-3-36           | 1        |          |       | 2-1-84   |                      | 9    |
|          | 472060-3-9            | 2        |          |       | 3.684    | <u> </u>             | 9    |
|          | 47.660-3-2            |          |          |       |          |                      | 0 9  |
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TVA 10579E (EN DES-7-79)

#### ENGINEERING CHANGE NOTICE NO. 35//

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 4

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| APPECTED                                         | DRAWING OR S/M NUMBER | REY      |         | ACTUAL  | REMARKS                                          | DN DATE |          |
| +                                                | 494060-3-19           |          | 3-19-01 |         |                                                  | ю       | و        |
|                                                  | 47A060-3-4            | 2        | 1       | 2-1-14  |                                                  |         | 4        |
|                                                  | 19400-3-3             | #        |         |         | DELETA                                           |         | Ŧ        |
| 1                                                | 474060 · 3 · 36A      | 0        |         | 2-1-84  | VSCRIB                                           |         | 10       |
| <del>                                     </del> | 038-1AFW- R12         | 902      | <b></b> | 210-84  |                                                  |         | 10       |
|                                                  | 038-14FW-R19          | 902      |         | 7       |                                                  |         | 10       |
|                                                  | 038-IAFW-RZO          | 903      |         |         |                                                  |         | 0        |
|                                                  | 47A4Z7-Z-38           | 0        |         | 2-10-14 |                                                  |         | 10       |
| 1                                                | 47A4Z7- 239           | 0        |         |         |                                                  |         | 10       |
| 1                                                | 47A4Z7-Z-40           | 0        | V       |         |                                                  |         | O        |
| 1                                                | 47A427-2-39A          | 0        |         |         |                                                  |         | <u> </u> |
| 7                                                | 47A427-2-40A          | 0        | V       | 1/      |                                                  |         |          |
| 7                                                | 47AC6C-3-9A           | 1        | 3.15-84 | 3.684   |                                                  |         | 12       |
| 1                                                | - 3-9B                | 1        |         | 1/      |                                                  |         | 12       |
|                                                  | - 3 - 11A             | 0        |         | 3-6-84  |                                                  | 12      |          |
|                                                  | 474060-3-5A           | 0        | 3-15-84 |         |                                                  |         |          |
|                                                  | 474040-3-5B           | 0        |         |         |                                                  |         | •        |
|                                                  | 474060-3-5C           | 0        | 1       |         |                                                  |         |          |
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| iystem or Feeture        | AUXILI        | ARY                               | FEE         | DWATER       | <u>- 575</u> | 38            |                |       |      |
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| 10050-00                 | - N - 1       |                                   |             |              |              |               |                |       |      |
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| EV. | OATE<br>ISSUEO | PRE.                  | SUPV.    | HEAD                                         | CHEF         | ECN<br>CLERK | SSOCI | ATED D                                | RAWING | OESCA       |                                          |             |          | )        |       |       | PAG         |
|     | OATE<br>ISSUEO | PRE.                  | SUPV.    | HEAD                                         | CHIEF<br>V/A | ECN<br>CLERK | SSOCI | ATED D                                | RAWING | OESCA       |                                          |             |          | 3        |       |       | PAG         |
|     | OATE<br>ISSUEO | PRE.                  | SUPV.    | HEAD                                         | CHIEF<br>W/A | ECN<br>CLERK | SSOCI | ATED D                                | RAWING | OESCA       |                                          |             |          | 3        |       |       | PAG         |
|     | OATE<br>ISSUEO | PRE.                  | SUPV.    | HEAD                                         | CHIEF<br>L/A | ECN<br>CLERK | SSOCI | ATED D                                | RAWING | OESCA       |                                          |             |          | )        |       |       |             |
|     | OATE<br>ISSUEO | PRE.                  | SUPV.    | HEAD                                         | CHEF         | ECN<br>CLERK | SSOCI | ATED D                                | RAWING | OESCA       |                                          |             |          | )        |       |       | PAG         |
|     | OATE<br>ISSUEO | PRE.                  | SUPV.    | HEAD                                         | CHIEF<br>V/A | ECN<br>CLERK | SSOCI | ATED D                                | RAWING | OESCA       |                                          |             |          | <b>)</b> |       |       | PAG         |
|     | OATE<br>ISSUEO | AFA)                  | 30×      | HEAD                                         | CHIEF<br>W/A | ECN<br>CLERK | SSOCI | ATED D                                | RAWING | OESCA       |                                          | N OF R      | EVISION  | )        |       |       | PAG         |

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN.

### ENGINEERING CHANGE NOTICE NO. 251

**~~ Z** 

| AFFECTED                                         |                   | gura<br>REV. | CHESTES  | ACTUAL. |          | Agmany De Carta | <b>,</b> |
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DOUGH OF CRANCE ESTIMATE

|                                        | s by this     | section v     | ill require add:           | itional mate          | rials as li                   | sted below                            |
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TENNICESCE VALLEY AUTHORITY DIVISION OF ENGINEERING OCCION:

### ENGINEERING CHANGE NOTICE NO. 3511 DATA SHEET NO. 6

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#### SCOPE OF CHANGE ESTIMATE

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| _/ Revis                              | ions by this :<br>_ | section w     | ill require addi              | itional mate          | rials as lis                  | ted below |
| Item                                  | Unit 1<br>Qty       | Unit 2<br>Qty | Procured By<br>(EN DES/CONST) | PR, Reqn,<br>or Contr | Requested<br>Delivery<br>Date | Remark    |
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Preparer
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Section Supervisor

## ENGINEERING CHANGE NOTICE COVER SHEET SWP '82 1217 516

(BEFORE ISSUANCE OF OPERATING LICENSE)

| TENNESSEE<br>DIVISION OF |            |                   |              | <b>v</b>         | _             |             |                                                       | 3636<br>Spring City, IN |
|--------------------------|------------|-------------------|--------------|------------------|---------------|-------------|-------------------------------------------------------|-------------------------|
| To: Constr               | uction f   | Yoject M          | anager ,     | Watts            | Bas           |             | Plant Works Bor Michour Fluid,<br>G. 13 K SMP 204 GBK |                         |
| From: Design             | Project    | Manager           | S            | SWP.             |               | <u> 204</u> | - 1 1 1 1                                             |                         |
| DATE DEC                 | .71        | 982               |              |                  | -             |             | Budget                                                | Hem 221                 |
| Was IJ Analysis          | Require    | rd:               | Yes _        |                  | ¥0_ <u></u>   | -           | 83031740                                              | 207 (le)                |
| CHARLES                  | <u>C</u> . | F151              | HER          |                  | SWE           |             | E2 CANCELLON LE SOCIE                                 | on Lead of              |
| ar.                      |            | la a              | ,            |                  |               | 7           | C. Tenetto                                            | 12/2/52                 |
| Pr                       | oiect Er   | gineer            |              | Rele             | a sect :      |             | Gesign Project Manager                                | Date                    |
| •                        | .,         |                   |              |                  |               | /           | . RM                                                  |                         |
|                          |            |                   |              |                  |               | SCOPE       | : V                                                   |                         |
| Project WAT              | 15         | BAR               | NUC          | L <b>e a</b> r   | PH            | ANT         | Affected Unitis)                                      | <u>&amp; 2</u>          |
| System or Featu          | re AL      | XLL               | ARY          | FEE              | NA            | TER         | SYSTEM (3) XER PRES                                   | X (3/11 X(2)-           |
| Reference & De           | د ایر اعد  | n of Char         | nye _        | uA. a            | EP            | OWER        | PLEVER IKOM CINEVILL                                  | BKEAKE                  |
|                          |            |                   |              |                  |               |             | R STARTER FOR ELECTI                                  |                         |
| _                        |            |                   |              |                  |               |             |                                                       |                         |
| CIRCUIT<br>DRAWINGS OF   |            |                   |              | KEF<br>Yes       |               | CK & V      | EATCH FINDING REPORT NO                               | MBER F 136              |
|                          |            |                   | /EU:         | or               |               | a Sheet     | EMBINEERING SUPPORT BRANCHES                          | Yes or No               |
| (Data Shi                | eets Rec   | (Derived)         |              | No               | Av            | ailable     | Approval Required                                     | 185                     |
|                          |            | •                 |              | _                |               |             | CON.                                                  |                         |
|                          | .=         | -                 |              |                  |               | 3           | ECN is contry for by branch review                    |                         |
|                          | A C        |                   |              |                  |               |             | Design Project Manager                                | 7-19-87<br>Date         |
| tric                     | , <b>1</b> |                   | 4            |                  |               |             |                                                       |                         |
| Message                  |            |                   |              | NO               |               |             | Approved:                                             |                         |
| Nuclear                  |            |                   |              |                  |               |             | - MA                                                  |                         |
| BAT                      | E          | MAR               | 3 196        | 3346             |               |             | Fa Chand W Vlace                                      | Date /-/8-52            |
| Civil                    | HE1140 C   | <del>****</del> * |              |                  |               |             | ERS ELECTRICAL DR. CHIEF                              | Date                    |
|                          |            | سسامره            |              | NO               |               | <del></del> | N/A                                                   |                         |
| Electrical<br>Mech       | EZ /       | rq.               |              | YES              |               |             | ENS MECHANICAL BR. CHIEF                              | Date                    |
| MECH                     |            |                   |              | NO               | -             |             | Chief Nuclear Engineer                                | 11-19-8z                |
|                          |            |                   |              |                  |               |             | L                                                     | Date                    |
|                          |            | -016613 06        | 3 i <b>G</b> |                  |               | SWP         | Required for SAR or FSAR 18                           | Yes or No               |
| SPECIAL DES              |            |                   |              | NO               |               |             | Required for Preoperational Test:                     | YES NO                  |
| APCRITECTU               | fat soppe  | ST SEAS CH        |              | NO               |               |             | If Yes, Test No                                       |                         |
|                          |            |                   |              |                  |               |             | Vendor Backcharges Involved                           | ND                      |
|                          |            |                   |              |                  |               |             | Seismic Analysis Required                             | NO                      |
| SHARKET MONK             | Pre-Qu     |                   |              | Comm't           |               |             | Nonconformance Report Required                        | ND                      |
|                          | Test       | Load              | Power        | Comm't<br>Oper'n | 1st<br>Refuel |             | QA Applies                                            | YES                     |
| Unite 142                |            | V                 |              |                  |               |             | Security System Modified                              | NO                      |
| Unit(s)                  |            |                   |              |                  |               |             | Vendar(s) involved:                                   | NONE                    |
| <del></del>              |            |                   |              |                  |               | <del></del> |                                                       |                         |
| CC {Attachmests          |            |                   |              |                  |               |             |                                                       | · · ·                   |
| RIEF, ACCUITECTUS        | 14 SUPPO   | OT SOMECH         | W#C176       | C - E            |               | CHIE        | F. COST PLANNING AND CONTROL STAFF, WIZETA C-         | i                       |

4年日 日日

11/1/82 Those Listed 11:1-1:0-H. L. Jones 4433 ROM W10A17 C-K WATTS BAR - INDEPENDENT REVIEW Please handle the attached Black & Veatch review F 136 per SEF 82-21. finding number L. W. Boyd, W7A18 C-K J. W. Coan, 105 ESTA-K E. H. Cole, 205 GB-K J. A. Ellis, W9A19 C-K R. S. McKeehan, W10A8 C-K R. A. Pedde, E7821 C-K L. I. Perry, W8D200 C-K - Lead cc: R. M. Pierce, 104 ESTA-N - For Information Only E. G. Beasley, W12826 C-K - For Information Unly J. R. Lyons. 902 HBB-K - For Information Only \* 2 Jenning Street, and Children

ATTACHMENT L SHEET \_ OF 3

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WATTS BAR NUCLEAR PLANT TCN NO. 3636 B&V PROJECT 10520 ATTACHMENT. SHEFT 2 OF FINDINGS REPORT FINDING NUMBER FINAL CLASSIFICATION F/36 TYPE CATEGORY IFILLED IN BY SENIOR PEVIEW TELM CHAIRMAN DESCRIPTION: (Item B-5 of Electrical checklist) FEAR Subsection 8.3.1.1, none 8.3-23 culscriber title Electric Circuit protection, prongraph two states"... each motor protector is selected and set to project the motor mad its calle 1) Wining di some on 45B1768-2E indicates that DRE .25 HP And LEAD REVIEWER'S ACTION REMARKS: RECOMMENDED CLASSIFICATION TYPE O SIGNATURE MMMousea DATE 11-1-82 CATEGORY A PROJECT MANAGER'S ACTION REMARKS: RECOMMENDED CLASSIFICATION TYPE \_\_\_ SIGNATURE . DATE CATEGORY \_\_\_ SENIOR REVIEW TEAM ACTION (COMPLETE FINAL CLASSIFICATION IN BOX ABOVE) REMARKS: SIGNATURE \_\_ DATE SHEET 1 (CHAIRMAN) CONTID ON SHEET Z

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#### WATTS BAR NUCLEAR PLANT B&V PROJECT 10520

FINDINGS REPORT CONTINUED

UN NO. 363 ATTACHMENT

FINDING NUMBER - F/36 circuit prepter no Q Auf FW pump P-P luke cit pung B 1-1771-3-1281-B) circuit number 1-116-3-1220-12 pump value B-PEHC Actuation mrn-7-132-A) ciaco. + number 1- 4Pl-3-6391-A dossa standard DS- E7.2.1 does indicate that breaker no EF7-1020 for this populartion @ cincuit wunder 1-981-2-6291-B 3C # 12 AWE type WLC ( Cross linked polyellale. insulation, puc inchet 90°C conduction cincuit wumber 1-181-7-6370-11 19 30 # 12 AWE, type wEC-1( polyethrlene insulation, puc jacket, 75°C conductor temp Rise. 6 Electrical indicates these cables acces pointe Ampene continuous capacity cincuit protective Ampene trip ~0 45 W751-7 states that cables are sized has And not propere breaker, This is F5AR Conclusion -Item 7 indicates philosophy of sizing cohles is not condence with FSER committeent. SHEET 2 CONT'D ON SHEET -

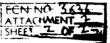
FORM 1

## WATTS BAR NUCLEAR PLUIT INDEPENDENT REVIEW

ECN NO. 3636 ATTACHMENT. 2 SHEET LOF 2

FINDING RESPONSE

| Pinding number 1F1 1:1/2/       | Date finding received from Black & Veatch A NOV 182 |
|---------------------------------|-----------------------------------------------------|
| Additional information pertin   | · · · · · · · · · · · · · · · · · · ·               |
| 176M 7 = SECTION 931.4          | 1 883-39 OF THE FLAR STATES                         |
|                                 | ABLES ESCOUNT MOTOR CIRTUITS                        |
| 10 BASED ON NOT 1556            |                                                     |
| CURREUIS INTO 11 OF P           | 28AVING 45W151-7 RIS 8TATES                         |
| THAT CHBILLS ARE SIZE           |                                                     |
|                                 |                                                     |
| Comments relative to confirming |                                                     |
| TITU 6: THE CONCINSIO           | MS ARE CORRECT, NITITHER THE                        |
| CABLE OR MOTOP ARE PRO          | TECTED THIN SCHEME WAS                              |
| MLY KED IN A LIMITED            | NUMBER OF CASES THE SITUATION                       |
| VILL BE CORRECTED.              |                                                     |
|                                 |                                                     |
|                                 |                                                     |
|                                 |                                                     |
|                                 |                                                     |
|                                 |                                                     |
| /                               |                                                     |
| L' Nerry                        |                                                     |
| Program Team Member             | //- 3 - P 2 Date                                    |
|                                 |                                                     |
| OF DC Program M                 |                                                     |
| OEDC Program Mamager            | Date                                                |
| ate finding response transmit   | •                                                   |



FINDING 136. LOAD THERE IS NO DISCONTINUITY BETWEEN THESE STATEMENTS NOTE WHEN A CIRCUIT EREAKER AND A MOTOR STARTER ARE PROVIDED THE THERMAL OVERLOAD ELEMENTS OF THE STARTER PROTECT THE MOTOR AND CABLE FROM OVERLOADS. THE CIRCUIT BREAKER PROVIDES SHORT CIRCUIT PROTECTION AND SERVES AS A PISCONNECTING MEANS FOR THE MOTOR CIRCUIT, IT IN NOT A REQUIREMENT THAT THE BREAKER RATING MATCH THE CABLE RATING.

| To:                 |                 |             |                                                  | •                                                | 711 8        | r N.C.                                  | er Flant,                                        | մ <b>բ</b> ուռ <b>ց</b> (                     | MI Mil            |             |            | •           |                                        | PAGE 1        |
|---------------------|-----------------|-------------|--------------------------------------------------|--------------------------------------------------|--------------|-----------------------------------------|--------------------------------------------------|-----------------------------------------------|-------------------|-------------|------------|-------------|----------------------------------------|---------------|
|                     | Des             | ngri Pro    | ect Ma                                           |                                                  |              |                                         |                                                  |                                               |                   | -<br>Releas | ed By:     | 8. L        | 9. Core                                | ems           |
| , ite:              | JF              | N ·         | <del>: 198.</del>                                | gager S                                          |              |                                         |                                                  |                                               |                   | _           |            | ADDO        | en Project Man                         | 18987         |
| Prepari             | 19 Sec          | tion        |                                                  |                                                  | L            |                                         | MEDS                                             | Accessi                                       | on No.            |             |            | MEDS        | Accession No.                          |               |
|                     |                 | KAL         | #/                                               |                                                  |              | SWF                                     | 101                                              | ) n                                           | 1 20              | r 1 7       | R          |             |                                        |               |
| By Jul              |                 | ٠.          | 10-1                                             | Ziensc                                           | P            | SHI                                     |                                                  | <u>, U</u>                                    | 120               | 513         | 4          |             |                                        |               |
| Total P             |                 | -           | <u> </u>                                         | 2                                                | - R          |                                         |                                                  |                                               |                   |             | R          |             |                                        |               |
| Section             |                 | 101         | 7                                                | <del>ڳ</del>                                     |              |                                         |                                                  |                                               |                   |             | 5          |             |                                        | •             |
| Supervn<br>Stall En |                 | 20          | m                                                | <u>~</u>                                         | R            |                                         |                                                  |                                               |                   |             | R          |             |                                        |               |
| Architec            |                 |             | N/A                                              |                                                  | 2            |                                         |                                                  |                                               |                   |             | 6          |             |                                        |               |
| Group               | a               | 1           | Tole                                             | 0,4:                                             | R            | †                                       |                                                  |                                               |                   |             | R          |             |                                        |               |
| Head:<br>Branch /   | <del>7.</del> - | <u>D. (</u> | pu                                               | 110                                              | 3            |                                         |                                                  |                                               |                   |             | 7          |             |                                        |               |
| Chief:              |                 |             |                                                  |                                                  | ate          | ٠                                       |                                                  |                                               |                   |             | L          |             |                                        |               |
| 20.001              | 4/              | 9770        | - D                                              | 00.                                              | 1400         | 110                                     | PLAN                                             |                                               | COPE -            |             |            |             |                                        |               |
|                     |                 |             |                                                  |                                                  | VACE         | EMK.                                    | ZAN                                              |                                               |                   |             | _          |             | its 1/2                                | <u> </u>      |
| System              | or Fea          | ture        | 21                                               | $\frac{4n}{2}$                                   | <b>20</b> 4  | · F                                     | 19.77                                            | MEG                                           | eu!               | IŽ.         | <u>ソラフ</u> | 12111       | 43)                                    |               |
| Referen             |                 | escript     | tion of                                          | Chan                                             | I            | Daci                                    | E                                                | 717                                           | 2 N I             | الماه الماء | E          | ONLY.       |                                        |               |
| 1/2                 | a .             | <u>م</u> .  | 15 7                                             | Ruch                                             | 1            |                                         | AFT                                              | m1 4n                                         | 1 40              | -45         |            | ,           | ······································ |               |
|                     |                 |             | 12/1                                             | (uc /                                            | ~            |                                         | AR 3                                             | 983                                           | 4- 7100           | 11.3        | /N V C     | DLVED.      | <del></del>                            |               |
|                     |                 |             |                                                  |                                                  | BATE         | .,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | -                                                |                                               | <del></del>       |             |            |             |                                        |               |
| CHP                 | N6.             | ED          | <u>:</u>                                         | <u> </u>                                         | R-42         | 3 - 2                                   | 27 /                                             | 10                                            | PREG              | -43-2       | 27         |             |                                        |               |
|                     |                 |             |                                                  | Н                                                | 15-4         | 13-20                                   | 0 7                                              | 0                                             | F5V-              | 43-20       | 500        | INDAF       | TING É E                               | ( <b>0</b> 0/ |
|                     |                 |             |                                                  |                                                  |              |                                         |                                                  |                                               |                   | 43-210      |            | 1000        | Total Co                               |               |
|                     |                 |             |                                                  |                                                  |              |                                         |                                                  |                                               |                   |             |            | ·····       |                                        |               |
|                     |                 |             |                                                  |                                                  |              |                                         |                                                  |                                               |                   | IAR-43      |            |             |                                        |               |
| REVI.               | 5 L 🗓           | . ,<br>     | Co                                               | NTRI                                             | 167          | Nu                                      | m BÉ.                                            | R                                             | × ,               | FCV-4       | 3-40       | 2.73        |                                        |               |
| HDI                 | EL              | , ; –       | CI                                               | ROSS                                             | 5            | RE                                      | FERE                                             | NCE                                           | $\mathcal{B}_{E}$ | TWEFN       | И.         | ZR-43       | -C/ -L                                 |               |
|                     |                 |             |                                                  |                                                  |              |                                         |                                                  |                                               |                   |             |            |             |                                        |               |
| 1120                | 20              |             | - //                                             |                                                  | 125          | 700                                     | AC. FI                                           | <u>,                                     </u> | 1 UE              | NTIFIE      | <u>v</u>   | MNOK        | DRAWA                                  | 467           |
| EKK                 | ) K 5           | 1           | <u>u i) _</u>                                    | DI:                                              | <u> 5CR</u>  | EPA                                     | NCIE                                             | 5                                             | NO.               | 287.        |            |             |                                        |               |
|                     |                 |             |                                                  |                                                  |              |                                         |                                                  |                                               | <del></del>       |             |            |             | _                                      |               |
| <del></del>         |                 |             |                                                  | ユ                                                |              | SEE                                     | SSOCIA                                           | TED DR                                        | AWINGS            | LIST, REV   | ERSE S     | DE          |                                        |               |
| EV DA               |                 | PAHED       | SECT.                                            | GROUP                                            | BRANCH       | ECN                                     | D.P.<br>MGR.                                     |                                               |                   | DESCRIPT    | ON OF      | REVISION    |                                        | 10            |
|                     |                 |             | 1                                                |                                                  |              |                                         |                                                  |                                               |                   |             |            |             |                                        | PA            |
|                     |                 |             | <del>                                     </del> | <del> </del> -                                   | <del> </del> | <del> </del>                            | <del>                                     </del> |                                               |                   | ····        |            | <del></del> |                                        | _             |
|                     |                 |             |                                                  | <u> </u>                                         | <b> </b>     | <del> </del>                            | <del>                                     </del> |                                               | <del></del>       | 63          | 774        | 7817        | <del> </del>                           | 3             |
| _                   |                 |             | <del> </del>                                     | <del> </del>                                     |              | <del> </del>                            | <del>                                     </del> |                                               |                   |             | لنا        | 1407        | 0.0                                    |               |
|                     |                 |             | <del> </del>                                     | <del> </del>                                     | <del> </del> | <del> </del>                            | ┝┈┼                                              |                                               |                   |             |            |             |                                        |               |
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| 1_                  |                 |             |                                                  | <b> </b> -                                       | <b> </b>     | <b></b>                                 |                                                  |                                               |                   |             |            |             |                                        |               |
|                     |                 |             |                                                  | <u> </u>                                         | <b></b>      | L                                       |                                                  |                                               |                   |             |            |             |                                        |               |
|                     |                 |             |                                                  |                                                  | L            | L                                       |                                                  |                                               |                   |             |            |             |                                        |               |
|                     |                 |             |                                                  | TT:                                              |              |                                         |                                                  |                                               |                   | SY YW       | an         | 303         | 617                                    | L             |
| lean No             |                 |             |                                                  |                                                  |              |                                         |                                                  |                                               | ૅ                 | 171 🕻       | ~ ~        |             |                                        |               |
| 'ir la              | eriais          | as folio    |                                                  | ,                                                |              |                                         |                                                  |                                               | _                 |             |            |             |                                        |               |
| 'ir la              | eriais          |             |                                                  | ,                                                | ATZ          | TAC:                                    | IMEN                                             | 17 ,                                          | 1 70              | WH?         | ; <i>i</i> | HEET        |                                        |               |

TENNESSEE VA. LEY AUTHORITY DIVISION OF ENGINEERING DESIGN-

## ENGINEERING CHANGE NOTICE NO. 3634 DATA SHEET NO. 2

mor 2

| AFFECTED<br>UNIT | ORAWING OR S/M NUMBER                  | Owe<br>REV. | ISSUE<br>EXPECTED | DATE<br>ACTUAL |           | REMARKS                               | DI DATA SHEET<br>REV. NO. |
|------------------|----------------------------------------|-------------|-------------------|----------------|-----------|---------------------------------------|---------------------------|
| H2               | 47W610-43-1                            | 10          | 1-21-83           | 2-1-83         |           | <u> </u>                              | 1                         |
| 1+2              | 474610-43-2                            | 7           | 1-21-83           | 1-20-83        |           |                                       |                           |
| H-2              | 4710610-43-5                           | 8           | 1-21-83           |                |           | *                                     |                           |
| 1+2              | 47W610 - 43-6                          | 11/         | 1-21-83           |                |           |                                       |                           |
| 1+2              | 47625-12                               |             | 1-21-63           |                |           | -                                     |                           |
| 142              | 47.8601-43-0                           |             | 1-21-83           |                |           |                                       |                           |
|                  |                                        |             |                   |                |           |                                       |                           |
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|                  |                                        |             |                   |                | <u></u> _ | L                                     |                           |

1 5 5

ATTACHMENT 1 TO DATA SHEET SLOBE OF PRINCE ESTIMATE LINTIS EAR NUCLEAR PLANT ECN NO. 3634 ESTIBLE AWILIARY BLUS SYSTEM/ HATURE: SAMPLING & WATER QUALITY SYSTEM (43) Revisions by this rection will not require additional natural [] Revisions by this section will require additional materials as listed below Requestod Unit 1 Unit 2 Procured By TR, Fogn, Delivery Qty (FR PHS/Const) Date

Section Supervisor

## TERMESSEE VALLEY AUTHORITY

|                                                                                      | TERMESSEE VALLEY AUTHORITY FIELD CHAPCE PROUEST REPLY MEMORAPOUM | WBHP-QCI-1.13 R5 Attachment A FCR <u>M-759 7</u> COC |
|--------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------|
| TO : J. C. Standiler, Sequey                                                         | yah and Watts Bar Design Projects Mana                           | <del>.</del>                                         |
| FF Guenter Wadewitz, Proje                                                           | ect Manager, Watts Bar Nuclear Plant (                           | CONST                                                |
| DATE: WBN '82 08                                                                     |                                                                  |                                                      |
| Attention: J L PUB                                                                   | RKEY (EN DES ON SI                                               | TE)                                                  |
| SECTION I - CONST PECUEST                                                            |                                                                  |                                                      |
| Peason for Change: Sta                                                               | cus rotat:                                                       | 22880089                                             |
| Prawing Discrepancy                                                                  | ✓ Prior to Fuel Loading Wor                                      | tem No. <u>03B</u><br>k Package No. <u>H003F-20</u>  |
| ✓ Facilitate Construction                                                            | After Fuel Loading but prior to Closing Capitalized Accounts     | k Plan No                                            |
| Additional Design Information                                                        | After Closing Capitalized Accounts for the Entire Plant          |                                                      |
| Pocuments Affected 038-2                                                             | VFW-RZZI %                                                       |                                                      |
| "arked documents required and                                                        | attached Yes No                                                  |                                                      |
| Document revision required                                                           | YesNo                                                            |                                                      |
| Change Pescription: REV                                                              | ISE PER THE ATTAC                                                | HED SKETCHES.                                        |
|                                                                                      |                                                                  |                                                      |
| Thange requested by:                                                                 | ONET Engineer)                                                   | MAS R BROWN (Unit Supervisor)                        |
| Change approved by                                                                   | LES Fraincer)                                                    | (Date)                                               |
| Approval obtained by                                                                 | , , , , , , , , , , , , , , , , , , , ,                          | ENDES ON SITE" Other                                 |
| Approved for characteristic a                                                        | $\sim 1$                                                         | EdBule                                               |
| SWP '82 1207 04                                                                      | 04Construction Engineer)                                         | (Project Fanager)                                    |
| FCH No. 51                                                                           | Date Issued                                                      | 12-7-82                                              |
| Brawing Nos: 038-285W                                                                | - R321 No. 901                                                   |                                                      |
| Change Complete Manage                                                               | Mesign Project                                                   | lifer k 12-282<br>Menager) (Date)                    |
| Original - Facura to Copy 3 - Percious  2 - Decided  pp 1 - Committee  708, 100 Care | cc: Hanger Insp                                                  | Dection Unit                                         |

## TENGESSEE VALLEY AUTHORITY FIELD CHANGE REQUEST

WEMP-QCI-1.13 R7 Attachment A PCR H-7(18)

|                                        | REPLY HEHORANDON                                                   | PCR H-7618          |
|----------------------------------------|--------------------------------------------------------------------|---------------------|
| TO : J. C. Standifer, Seque            | yah and Watts Bar Design Projects Mana                             | ger, 204 GB-E (3)   |
|                                        | ect Manager, Watts Bar Nuclear Plant C                             |                     |
| MEN 93 042                             | 5 710 /                                                            |                     |
| Accentions J.J. NASH (                 | EN DES ONSITE) A JONSSON                                           | 1 (W20220 (-K)      |
| SECTION I - CONST REQUEST              | 0.2                                                                | 1405-0-             |
| Reason for Change: Sta                 | tus Point:                                                         | 112580309           |
| Praving Discrepancy                    |                                                                    | Package No. HOO3FO? |
| Facilitate<br>Construction             | Work  After Fuel Loading but prior to Closing Capitalized Accounts | Plan No. NA         |
| Additional Design<br>Information       | After Closing Capitalized Accounts for the Entire Plant            |                     |
| Documents Affected 1-03A               | -403 (R904) & 48N416 R                                             | 4.                  |
| Marked documents required and          | attached Yes No                                                    | · 4/                |
| Document revision required             | Yes                                                                |                     |
| Change Description: REVISE             | PER ATTACHMENTS                                                    |                     |
| 1                                      |                                                                    |                     |
|                                        |                                                                    |                     |
| Change requested by: DougLA            | 1ST Engineer) ARM, Tor                                             | C & Cf. 1-14-83     |
| Change approved by:                    | ST Engineer) ASM, For DES Engineer)                                | (Unit Supervisor)   |
| (EN                                    | DES Engineer)                                                      | (200)               |
|                                        | rerephone Memo                                                     | ے اربادات کے انہاں  |
| WBP '83 1115 13                        | DES: Bill E Harrage  9. L. (Construction Engineer)                 | N J Firely f        |
| SECTION II - EN DES REPLY/RESOL        | UTION                                                              | violect ( duaget)   |
| CN No. 51                              | Date Issued \\-                                                    | े<br>२.७ <b>५</b>   |
| Praving Nos: 1-034-4                   | 33 egas                                                            |                     |
| hange Complete (EM DES )               | 2 fr months                                                        | 1/3/13              |
| riginal - Return to CONST by to        | t ann                                                              | nager) (Pate)       |
| L. § 2 — Retained by EN nes            | off and the second                                                 | KER INSPECTION UNIT |
| opy 1 - Retained by OCAR EDS, 100 UB-K |                                                                    | •                   |

## TERNESSEE VALLEY AUTHORITY FIELD CHAPGE PEOURST

Attachment A

|                                                                                                                                                           | RETTLY MEMORAPDUM                                      | PCR HBOB3                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|----------------------------------------|
| TO : J. C. Standlfer, Sequoyah and                                                                                                                        | Watts Bar Design Project                               |                                        |
| FROM: Guenter Wedewitz, Project Man                                                                                                                       |                                                        |                                        |
| DATE: WENTON DODG                                                                                                                                         | 717                                                    |                                        |
| Attention: J.L. PURKET (E                                                                                                                                 | N DES ONSITE)                                          | E209201-321( )                         |
| SECTION I - CONST RECUEST                                                                                                                                 |                                                        |                                        |
| Reason for Change: Status Poi                                                                                                                             | int:                                                   |                                        |
| Prawing Discrepancy Pri                                                                                                                                   | or to Fuel Loading                                     | System No. 03 Work Package No. H003F20 |
|                                                                                                                                                           | er Fuel Loading but prior<br>Closing Capitalized Accou |                                        |
|                                                                                                                                                           | er Closing Capitalized counts for the Entire Plan      | ne                                     |
| Pocuments Affected 03B-ZAFW                                                                                                                               | 1-RZ15 (RO)                                            |                                        |
| "arked documents required and attach                                                                                                                      | ed Yes !'o                                             | · ·                                    |
| Change Description: ELIMINATE                                                                                                                             |                                                        | <b>5</b>                               |
|                                                                                                                                                           | 4 CONCRETE                                             | PASTNERS PER                           |
| ATTACHED SKETCH                                                                                                                                           |                                                        |                                        |
| Thange requested by: ART HIGH                                                                                                                             |                                                        | Chomas R. Brown                        |
| Change approved the Acceptance  Eli DES F                                                                                                                 | Shewell                                                | (Unit Supervisor) (6-30-8)             |
|                                                                                                                                                           |                                                        | (Date) "ENDES ON SITE"                 |
| Approved for transmittal to EN DES:                                                                                                                       | Drough P BLTU                                          | Made Oldusterles                       |
|                                                                                                                                                           | (Construction Engineer                                 | (Project Manager)                      |
| section ii - en des reply/pesolution for no. 4021                                                                                                         | •                                                      |                                        |
|                                                                                                                                                           | Date Issued                                            |                                        |
| Crawing Nos: 038-ZAFW-F                                                                                                                                   | EZIS SHT IEC                                           |                                        |
| Change Complete Des Engin                                                                                                                                 | eed 20 (Desagn Pro                                     | 9/10/83                                |
| Original - Return to CONST by EN DES<br>Copy 3 - Patained by CONST until o<br>Copy 2 - Patained by EN DES<br>Copy 1 - Retained by QCER<br>CEDS, 100 UB-K. | cc: Hanger                                             | Inspection Unit                        |
| en en en en en en en en en en en en en e                                                                                                                  |                                                        |                                        |

FIELD CHAPGE PROUEST

While-colors to Attachment A

|                                                               | REPLY MEMORANDUM                                             | FCR <u>H8736</u>                           |
|---------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------|
| TO : J. C. Standifer, Sequoya                                 | ah and Watts Bar Design Projects                             | Manager, 204 GB-K (3)                      |
| FROM: Guenter Wadewitz, Project                               | ct Manager, Watts Bar Nuclear Pla                            | ant CONST                                  |
| DATE: WBN '82 090'                                            |                                                              |                                            |
|                                                               | EY (ENDES ONSITE)                                            | 83032200025                                |
| SECTION I - CONST RECUEST                                     | ,                                                            |                                            |
| Peason for Change: Stat                                       | us Point:                                                    |                                            |
| Prawing Discrepancy                                           | Prior to Fuel Loading                                        | System No. 03A<br>Work Package No. H003F04 |
| Facilitate<br>Construction                                    | After Fuel Loading but prior to Closing Capitalized Accoun   | Work Plan No. NA                           |
| Additional Design                                             | _ After Closing Capitalized<br>Accounts for the Entire Plant |                                            |
| Pocuments Affected 1-03A                                      | 4-458 R/901                                                  |                                            |
| "arked documents required and                                 | attached Yes No                                              |                                            |
| Document revision required                                    |                                                              |                                            |
| Change Pescriptio : REVIS                                     | SE HANGER PER ATTA                                           | CHED SKETCHS                               |
|                                                               |                                                              |                                            |
|                                                               | 1                                                            | ×                                          |
| Change requested by: Laune                                    | Mushon & 6-22-82                                             | JOM Braun)                                 |
|                                                               | NST Engineer)                                                | (Unit Supervisor)                          |
| Change approved by:                                           | DES Engineer)                                                | 8-4-87                                     |
| Approval obtained by:                                         |                                                              | (Date) FIELD ENDES                         |
| Approved for organization EM                                  | $\alpha N_{i} = 0$                                           | Were Mark College                          |
| SWP '83 0310 07                                               | 2 (Construction Engine r)                                    | Project Manager)                           |
| SECTION IT FU DES REPLY/PESO                                  | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~                      |                                            |
| FCH NoNA                                                      | Date Issued                                                  | NA.                                        |
| Brawing Nos: Reject! Revises                                  | Llorde per ECNe 2576 8 3                                     | Vo .                                       |
| Change Complete (FY DOS)                                      | · 1/2/83 AMO                                                 | 3/7/83                                     |
| Original - Parum - court                                      |                                                              | ect Manager) (Date)                        |
| Original - Return to COUST by a Copy 3 - Pecained by Coust at | EN DES co: Hanger atil original is returned                  | Inspection Unit                            |
| opy 1 - Recained by Con-                                      |                                                              |                                            |
| EDS, 100 UB-K                                                 |                                                              | ·                                          |

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|    | REPT | Y. | MEDIOR | A | r'D | LDM |   |

FCR H 8404

| noc                                                                                            |
|------------------------------------------------------------------------------------------------|
| TO 1 J. C. Standifer, Sequoyah and Watts Bar Design Projects Manager, 204 GB-K (3)             |
| FROM: Guenter Wedewitz, Project Manager, Watts Bar Nuclear Plant CONST                         |
| DATE: WBN 82 0927 313. (209 60-K)                                                              |
| Attention: J. L. PURKEY, (EN DES ON SITE) / A. JONNSON                                         |
| SECTION I - CONST RECUEST E3021600435                                                          |
| Feason for Change: Status Point:                                                               |
| Prior to Fuel Loading                                                                          |
| Facilitate After Fuel Loading but prior Construction to Closing Capitalized Accounts           |
| Additional Design After Closing Capitalized Information Accounts for the Entire Plant          |
| Pocuments Affected 03B - 14FW - R126 R 902                                                     |
| **arked documents required and attached Yes No                                                 |
| Document revision required Yes No                                                              |
| Change Description: REVISE TO SHOW HANGER 03B- 14FW - R12L                                     |
| ATTACHING TO 030- LAFW- R141 AS SHOWN ON ATTACHED                                              |
| SKETCH. APPROVE ATTACHMENT TO EXISTING STEEL PLATFORM AS SHOW                                  |
| Change requested by: 10 applements 104 CHOMAS R. BROWN  (CONST Engineer) (Unit Supervisor)     |
| Change approved by: Solic Supervisor)                                                          |
| (EN DES Engineer) (Date) ON SITE EN DES                                                        |
| Approval obtained by: Telephone Nemo Other                                                     |
| SWP '83 0208 054 (Construction Engineer) Ally (Michaelit                                       |
| SWP '83 0208 054 (Construction Engineer) (Project Manager) SECTION II - EN DES REPLY/PERGUTION |
| FCN No. SI Date Issued 1/28/83                                                                 |
| Drawing Nos: 03B-IAFW-R126 Sh   R903 AND Sh 2 R903                                             |
| Change Complete 207 Joneson. Observation (Date)                                                |
| Original - Return to CONST by EN DES cc: Hanger Inspection Unit                                |
| Copy 3 - Petained by COMST until original is returned Copy 2 - Retained by EN DES              |
| opy 1 - Retained by QCAR                                                                       |
|                                                                                                |

## TENNESSEE VALLEY AUTHORITY

MB M-1-72 27

|                                                                                                                                             |                                | ANGE REQUEST<br>MEMORANDUM            | Attachmen:<br>FCR <u>H87</u>             | 21 -67         |
|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------------------------------|------------------------------------------|----------------|
| ™: J. C. Standifer, Sequo                                                                                                                   | ah and Watts Bar               | Design Projects                       | DOC DOC Manager, 204 GB-K (3)            | <del></del>    |
| FROM: Guenter Wadewitz, Proje                                                                                                               | ect Manager, Watt              | s Bar Nuclear Pla                     | nt CONST                                 |                |
| DATE: WEN 82                                                                                                                                | 1228 3                         | 37                                    |                                          |                |
| Attention: J.J. NASH                                                                                                                        | (EN DES OF                     | VSITE)                                | <u>331208BU579 (</u>                     | 1)             |
| SECTION I - CONST REQUEST                                                                                                                   |                                |                                       |                                          |                |
| Reason for Change: Sta                                                                                                                      | tus Point:                     |                                       |                                          |                |
| Prawing Discrepancy                                                                                                                         | Prior to Fue                   | Loading                               | System No. O3A<br>Work Package No. H003F | <del>2</del> 2 |
| Facilitate Construction                                                                                                                     | After Fuel Lo<br>to Closing Ca | pading but prior<br>spitalized Accoun | Work Plan No                             |                |
| Additional Design<br>Information                                                                                                            | After Closing Accounts for     | Capitalized<br>the Entire Plant       |                                          |                |
| Documents Affected 1-03A-                                                                                                                   | 405 (1903)                     |                                       |                                          | •              |
| Marked documents required and                                                                                                               | attached V                     | Yes No                                |                                          |                |
| Document revision required                                                                                                                  |                                |                                       |                                          |                |
| nge Description: REVISE                                                                                                                     | HANGER 1-                      | 03A-405 A5                            | SHOWN ON TH                              | E              |
| ATTACHMENTS.                                                                                                                                |                                |                                       |                                          |                |
| 10-M-12                                                                                                                                     |                                | ·                                     |                                          |                |
| Change requested by: Dougla                                                                                                                 | S R. BROWN<br>NST Engineer)    | 1 80 25 82 JA                         | OMAS R. BROWN (Unit Supervisor)          |                |
| Change approved by:                                                                                                                         | de K. Back DES Engineer)       | <u>*</u>                              | (Unit Supervisor)  10/22/82 (Date)       |                |
| Approval obtained by:                                                                                                                       | Telephone                      | Me                                    | mo Oth                                   | er .           |
| WBP '83 1129 22                                                                                                                             |                                | uction Engineer)                      | E Project Manag                          | · -            |
| SECTION II - EN DES REPLY/RESO                                                                                                              | LUTION                         |                                       |                                          |                |
| ECN No. 3667                                                                                                                                | 1                              | Date Issued _ 😤                       | 11-17-83                                 | •              |
| Drawing Nos: 1-03A-401                                                                                                                      | <b>2</b> 18904                 |                                       | . 1                                      |                |
| Change Complete J.C. (EN DES                                                                                                                | Engineer /4LP                  | Disign\Proje                          | et Manager) 1)15/8                       | 3              |
| ( Iginal - Return to CONST by<br>Lopy 3 - Retained by CONST u<br>Copy 2 - Retained by EN DES<br>Copy 1 - Retained by CCGR<br>PEDS, 100 UB-K | EN DES ntil original is        | returne                               |                                          |                |

|            |                                | NEB830422                                                                                                                | 1260           | Closes                                             |
|------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------------|
|            | TVA 20618 (EN DES-10-81)       | COMMITMENT TRACKING                                                                                                      | RECORD         |                                                    |
| Ţ <b>(</b> | 1 RESPONSIBLE ORGANIZATION     | 2 DATE 3 CHECKUP DATES                                                                                                   | 4 DUE<br>DATE  | S IDENTIFICATION                                   |
|            | EEB                            | 4-21-83                                                                                                                  | 10-1-83        | WBN-RI8                                            |
|            | 6 COMMITMENT TITLE             | AN Enjoyen in Title                                                                                                      | in togarde - 1 | LA V Gradu                                         |
|            |                                |                                                                                                                          |                |                                                    |
|            | 7 SAR TECHNICAL RESPONSIBILITY | 8 NLS<br>RESPONSIBILITY                                                                                                  | 1              | CMITMENT<br>OCATION<br>EN TO OEDC                  |
|            | EEB                            | KKN                                                                                                                      |                | ey to OEDC<br>dated 4/14/8.<br>0414 401)           |
|            |                                |                                                                                                                          |                | JT14 4UI)                                          |
|            | JAR to FUX 1/2                 | 18                                                                                                                       | Full do 301    | 195488150                                          |
|            | JAR to FUX the FUC to JAR SI   | 2.8.1 Luc ret but all                                                                                                    | that my min    | /==p==1503                                         |
| <u> </u>   | JAR to FUX the FUC to JAR SI   | 2/83 (NEBRENIAR 266)<br>119/03 (CEAR 90523912)<br>2.8.1 Sur rot list all<br>I write Horoga                               |                | 1224 8 8 1 5 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 |
|            | JAR to FUX the FUC to JAR SI   | 2.8.1 Luc ret but all                                                                                                    | that my min    | 1554581583                                         |
|            | JAR to FUX the FUC to JAR SI   | 2.8.1 Luc ret but all                                                                                                    | that my min    | 1554501500                                         |
|            | JAR to FUX the FUC to JAR SI   | 2.8.1 Luc ret but all                                                                                                    | that my min    | 1254501503                                         |
|            | JAR to FUX the FUC to JAR SI   | 2.8.1 Luc ret but all                                                                                                    | that my min    | 1256501503                                         |
|            | TAR to FUX the FUC to SAR ST   | 2/83 (NEBRA) 246) 111/03 (EEN290523912) 2.8.1 day not but all 2 water starage 83'                                        | that my min    |                                                    |
|            | TAR to Fux the Fuc to JAR 5    | 2/83 (NEBRA) 246) 111/03 (EEN290523912) 2.8.1 day not but all 2 water starage 83'                                        | 1020E U 165    | 12=2501503<br>1017 931<br>20 WUX                   |
|            | MEDS, WSB63 C-K                | 19/03 (EERS 2428 246) 119/03 (EERS 20523912)  2. S. I done not but all busine started.  83  ONLY AT CLOSURE: Manuallie & | 1020E U 165    | 017 93<br>2 WW.                                    |

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#### Instructions:

The organization making or identifying a commitment fills out Commitment Tracking Record (CTR) blocks 2, 3, 4, 6, 9, and 11, and (if known) block 1. Block 1 should name the responsible organization, and in promotheris a person to contact. Commitment Location (block 9) should dite documents containing the commitment, (e.g., SAR sections, NCR number, violation report number), and should include the MEDS number when it's known.

The identifying organization then immediately transmits the CTR to NEB-NLS.

NEB-NLS assigns the Identification Number (block 5), and transmits a copy of the CTR to the responsible organization and other affected organizations.

The responsible organization then (1) controls the commitment (i.e., performs the actions committed); (2) upon completion of the committed action, fills out Resolution (block 12, see note) and returns the completed CTR to the Chief Nuclear Engineer, attention NEB-NLS, by the return form portion of the related Transmittal/Return Memorandum (T/RM).

Note: The person(s) making an entry at Status (block 13) or Resolution (block 12) must initial and date the entry.

The intent of the resolution block (block 12) is to provide evidence of resolution, or else to provide NLS with information required to track the commitment to completion.

The resolution block should either (1) identify the resolution work and its date of completion, or (2) cite the transfer of tracking responsibility into an equivalent tracking system.

In either case, the MEDS numbers of applicable documents should be included. In case (2) the resolution block should include the equivalent tracking system's name and the entry number and date.

Attachment No. 1 Page 1 of COMMITMENT TRACKING RECORD DATE FILED CHECKUP DUE DATE IDENTIFICATION NUMBER DATES 4-20-83 WBN-R190 Revision WBN 40 TPIPE NLS COMMITMENT RESPONSIBILITY · LOCATION Black and Veatch XKN Finding F302 10 TRANSMITTAL RECORD [FROM-TO-DATE (MEDS NO.)] - FOR NLS USE ONLY 4/21/83 (CEB830121009 WBN Des ordgram revision Mas bч

12 RESOLUTION (FILL OUT ONLY AT CLOSURE) NEB830421 36 DOCUMENT OR SYSTEM TRACKING OR CLOSING COMMITMENT: DATE DOC/SYS: ENTERED:

form TVA 10618

RESPONSIBLE

ORGANIZATION

COMMITMENT TITLE

SAR TECHNICAL

RESPONSIBILITY

11 EXPLANATION

WBN

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| 13 STATUS |                                       |                                       |
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#### Instructions:

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| GRAMIZATIONIS  ACTION 1000-000LP-0LPM /30/E4  (1) MEB - CFB /2 130163  (2)  (3)  (4)  (4)  (5)  (6)  (7)  (8)  (9)  (1)  (1)  (1)  (1)  (1)  (1)  (1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | VA 10010 (EN DES - 9-63)                                    | COMMITME                        | INT TRACKING RE    | ECORD                                  | Closed                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|---------------------------------|--------------------|----------------------------------------|----------------------------|
| COMMITMENT TITLE PREVIOUSLY FEEDWAter System Pressure Drag Calculations - Black & Veatch Ttems F3/2 & F35.  B. NLS RESPONSIBILITY RESPONSIBILITY K.L. Napier  B. NLS RESPONSIBILITY LOCATION Memo from H.L. Jone to those 1/3ted, 3/3 EDC830328402  10 TRANSMITTAL RECORD [FROM TO DATE (MEDS ACCESSION NO.]] FOR NLS USE ONLY  JAR to CAC 11/1/83 NEB831101284  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB83121004  CAC to Tap. 11/21/83 MEB831 | 1 1100 010000                                               |                                 |                    |                                        | S IDENTIFICATION           |
| COMMITMENT TITLE   PURILIZED FERDINATE   System Pressure Drag Calculations - Black & Veatch Ttems F3/2 & F35.    Part technical responsibility   Responsibility   Responsibility   Responsibility   Responsibility   Responsibility   Responsibility   Responsibility   Responsibility   Responsibility   Responsibility   Responsibility   Responsibility   Responsibility   Responsibility   Responsibility   Responsibility   Responsibility   Responsibility   Responsibility   Responsibility   Reput from H.L. John for those   Instead, 312   EDC830328 402.    10 TRANSMITTAL RECORD [FROM TO DATE (MEDS ACCESSION NO.]] - FOR NLB USE ONLY   JAR to CAC   INJURES 112/183   RESPONSIBILITY   Reput for The CAC   INJURES 112/183   RESPONSIBILITY   Reput for The CAC   INJURES 112/183   RESPONSIBILITY   Responsibility   Reput for The CAC   INJURES 112/183   Reput for The CAC   INJURES 112/183   RESPONSIBILITY   Responsibility   Reput for The CAC   INJURES 112/183   Reput for The CAC   INJURES 112/183   REPUT for Each ACTION FOR TROI SYSTEM INPUT) - THE FOLLOWING COMMITMENT   LOCATION:    Committee of the Cac   INJURES 112/183   REPUT for Each ACTION FOR TROI SYSTEM INPUT) - THE FOLLOWING COMMITMENT   LOCATION:    COMMITMENT (S) TO NRC WERE MADE IN THE DOCUMENT/MEETING NOTED ABOVE IN BLOCK 9, "COMMITMENT LOCATION":    COMMITMENT (S) TO NRC WERE MADE IN THE DOCUMENT/MEETING NOTED ABOVE IN BLOCK 9, "COMMITMENT LOCATION":    COMMITMENT (S) TO NRC WERE MADE IN THE DOCUMENT/MEETING NOTED ABOVE IN BLOCK 9, "COMMITMENT LOCATION":    COMMITMENT (S) TO NRC WERE MADE IN THE DOCUMENT/MEETING NOTED ABOVE IN BLOCK 9, "COMMITMENT LOCATION":    COMMITMENT (S) TO NRC WERE MADE IN THE DOCUMENT/MEETING NOTED ABOVE IN BLOCK 9, "COMMITMENT LOCATION":    COMMITMENT (S) TO NRC WERE MADE IN THE DOCUMENT/MEETING NOTED ABOVE IN BLOCK 9, "COMMITMENT LOCATION":    COMMITMENT (S) TO NRC WERE MADE IN THE DOCUMENT/MEETING NOTED ABOVE IN BLOCK 9, "COMMITMENT LOCATION":    COMMITMENT (S) TO NRC SILVE (S) TO NRC SILVE (S) TO NRC SILVE (S) TO NRC SILVE (S) TO NRC SILVE    |                                                             | 1/30/EN                         | 10 1271 83         |                                        | WBN-R26                    |
| RESPONSIBILITY  WETS  K. K. Napier  Memo from H.L. Jone to those listed, 3/2  EDC830328402  10 TRANSMITTAL RECORD (FROM - TO - DATE (MEDS ACCESSION NO.)) - FOR NLS USE ONLY  JAR to CAC 11/183 NEG831101284  CAC to TAP 11/21/83 MEB83121004  CAC to JAR 12/21/83 MEB83121004  CAC to JAR 12/21/83 MEB83121004  11 EXPLANATION (INCLUDE A SHORT TITLE FOR EACH ACTION FOR TROI SYSTEM INPUT) - THE FOLLOWING COMMITMENT(S) TO NRC WERE MADE IN THE DOCUMENT/MEETING NOTED ABOVE IN BLOCK 9, "COMMITMENT LOCATION":  (01) Revise Pressure Drop 12/30/83 METS-CFB  Calculation S For  Auxiliary Feedwate(                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | (3)                                                         | ' '                             |                    | 1 1                                    | 3034019                    |
| 8 NLS RESPONSEBILITY WET3  8 NLS RESPONSEBILITY  X.L. Napier  10 TRANSMITAL RECORD [FROM - TO - DATE (MEDS ACCESSION NO.)] - FOR NLS USE ONLY  JAR +0 CAC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | e commitment title —                                        | Auxiliary F                     | erdwater S         | System Pres                            | sure Drag                  |
| RESPONSIBILITY  WETS  K. K. Napier  Memo from H.L. Jone to those listed, 3/2  EDC830328402  10 TRANSMITTAL RECORD (FROM - TO - DATE (MEDS ACCESSION NO.)) - FOR NLS USE ONLY  JAR to CAC 11/183 NEG831101284  CAC to TAP 11/21/83 MEB83121004  CAC to JAR 12/21/83 MEB83121004  CAC to JAR 12/21/83 MEB83121004  11 EXPLANATION (INCLUDE A SHORT TITLE FOR EACH ACTION FOR TROI SYSTEM INPUT) - THE FOLLOWING COMMITMENT(S) TO NRC WERE MADE IN THE DOCUMENT/MEETING NOTED ABOVE IN BLOCK 9, "COMMITMENT LOCATION":  (01) Revise Pressure Drop 12/30/83 METS-CFB  Calculation S For  Auxiliary Feedwate(                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Colculations                                                | - Black &                       | Veatch 7           | tems F3/a                              | 2 & F 355                  |
| RESPONSIBILITY  WETS  K. K. Napier  Memo from H. L. Jone to those listed, 3/2  EDC 8 30328 402  10 TRANSMITTAL RECORD (FROM - TO - DATE (MEDS ACCESSION NO.)) - FOR NLS USE ONLY  JAR to CAC III 183 NEB 8 3110128 4  CAC to TAB. III 21/83 MEB 8 31121004  CAC to JAR 1/2 1/83 MEB 8 31121004  CAC to JAR 1/2 1/83 MEB 8 31121003  11 EXPLANATION (INCLUDE A SHORT TITLE FOR EACH ACTION FOR TROI SYSTEM INPUT) - THE FOLLOWING COMMITMENT(S) TO NRC WERE MADE IN THE DOCUMENT/MEETING NOTED ABOVE IN BLOCK 9, "COMMITMENT LOCATION":  (01) Revise Pressure Drop 12/30/83 METS-CFB  Calculation S For  Auxiliary Feedwate(                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                             |                                 |                    |                                        |                            |
| TRANSMITTAL RECORD (FROM - TO - DATE (MEDS ACCESSION NO.)) - FOR NLE USE ONLY  JAR += CAC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 7 SAR TECHNICAL<br>RESPONSIBILITY                           | 8 NI                            |                    | LO                                     | CATION -                   |
| 10 TRANSMITTAL RECORD [FROM - TO - DATE (MEDS ACCESSION NO.)] - FOR NLS USE ONLY  JAR to CAC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | METS                                                        | K.L.                            | Vapier             | Themo tron to those                    | n M.L.Jone<br>115ted, 3/28 |
| COMMITMENT (2) TO NIC WERE MADE IN THE DOCUMENT/MEETING NOTED ABOVE IN BLOCK 9, "COMMITMENT LOCATION":  (01) Revise Pressure Drop 12/30/83 METS-CFB (2) Calculations For Auxiliary Feedwater                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | JAR to CAC 11/19<br>CAC to TAR 11/21                        | 13 NEG8311012<br>183 MB83112100 | 8 <del>4</del>     |                                        |                            |
| COMMITMENT(S) TO NAC WERE MADE IN THE DOCUMENT/MEETING NOTED ABOVE IN BLOCK 9, "COMMITMENT LOCATION":  (01) Revise Pressure Drop 12/30/83 METS-CFB (2) Culations For Auxiliary Feedwater                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                             |                                 | <del></del>        |                                        |                            |
| Calculations For Auxiliary Feedwater                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                             |                                 |                    | ······································ |                            |
| Palculations For Auxiliary Feedwater                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | COMMITMENT(S) TO NE                                         |                                 |                    |                                        |                            |
| Auxiliary Feedwater                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | COMMITMENT(S) TO NE                                         |                                 |                    |                                        |                            |
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| System                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | COMMITMENTIS) TO NE LOCATION":  (O1) Revise                 | Pressure Di                     | OCUMENT/MEETING NO | TED ABOVE IN BLOCK 9,                  | COMMITMENT                 |
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(STATUS AND INSTRUCTIONS - OVER)

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RESOLUTION (FILL OUT ONLY AT CLOSURE)

DOCUMENT OR SYSTEM TRACKING OR CLOSING COMMITMENT:

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#### Instructions:

The organization making or identifying a commitment fills out Commitment Tracking Record (CTR) blocks 1, 2, 4, 8, 9, and 11. Block 1 should name the responsible organization(s), group(s), and supervisor(s) responsible for each action. Commitment Location (block 9) should cite documents containing the commitment (e.g., SAR sections, NRC question number, NCR number, violation report number), and should include the MEDS accession number when it's known.

The identifying organization than immediately sends the CTR to NEB-NLS.

NEB-NLS assigns the Identification Number (block 5), inputs the Date Filed (block 3), and sends a copy of the CTR to the responsible organization and other affected organizations.

The responsible organization(s) then (1) controls the commitment (i.e., performs the actions committed); (2) upon completion of the committed action, fills out Resolution (block 12, see note) and returns the completed CTR to the Chief Nuclear Engineer, attention NEB-NLS, by the return form portion of the related Transmittel/Return Memorandum (T/RM).

### NOTE

The person(s) making an entry at Status (block 13) or Resolution (block 12) must initial and date the entry.

The intent of the Resolution (black 12) is to provide evidence of resolution, or to provide NLS with information required to track the commitment to completion.

The Resolution block should either (1) identify the resolution work and its date of completion, or (2) cite the transfer of tracking responsibility into an equivelent tracking system and should include the equivelent tracking system's name and the entry number and date.

In either case, the MEDS accession numbers of applicable documents should be included.

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#### MOTOR LIST FOR NCR W3NEEB8104

## Control Bay Sump Pumps, 3.7 hp

- 1 Mtr-40-2 2 Mtr-40-2

### Auxiliary Feedwater Pump Lube Oil Pumps, 0.25 hp

- 1 Mtr-3-118D-A 2 Mtr-3-118D-A 1 Mtr-3-128D-B

- 2 Mtr-3-128D-B

## Diesel Generator Lube Oil Circulating Pumps, 1.0 hp

- 1 Mtr-82-A1-A
- 2 Mtr-82-A1-A 1 Mtr-82-A2-A

- 2 Mtr-82-A2-A 1 Mtr-82-B1-B
- Z Mtr-82-B1-B 1 Mtr-82-B2-B
- 2 Mtr-82-B2-B

## EN DES NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

## NCR NO. WENEERS 164

SIGNIFICANT
YES M NO -

REPORTABLE
YES IN NO C

- A. Have any analyses, contracts, memorandums, etc., requiring EN DES work been generated? Yes 

  No 

  If yes, list in (C) below.
- B. Have all ECNs related to the NCR been issued?

  N/A □ Yes M No □ If yes, list in (C) below.
- C. Documents related to the NCR (ECN, analyses, memos, contract No., etc.)

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F. If any document listed in (C) above is indicated in the working status block, item 26 on the NCR cannot be signed.

outside EN DES to enable the completion of work required?

Yes M No N/A If yes, list in (C) above.

- G. Is all EN DES action complete? Yes 4 No D
- H. Remarks:

Verified By N.E.Alkire Date 11-14-73

| Nuclear Pr  | o;ect:                                                                                                                                                                       |                                           | G CONDITION REPORT JATION PAGE                                                                      | NCR NO. WBNEEB8104       |  |  |  |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------|--|--|--|
| ltem<br>No. |                                                                                                                                                                              |                                           | REMARKS                                                                                             |                          |  |  |  |
| 14          | Corrective /                                                                                                                                                                 | Action                                    |                                                                                                     |                          |  |  |  |
|             | sump pumps  <br>included in                                                                                                                                                  | perform no safety i<br>the TVA QA program | circulating pumps and function. Therefore to and are excluded from the sents of 10CFR50 Appearance. | they are not<br>the non- |  |  |  |
|             | The AFW lube oil pumps, however, are safety-related. The exis motors are being replaced with Class 1E motors of the proper rating (460 V ac) under TVA contract 83K8-833257. |                                           |                                                                                                     |                          |  |  |  |
| 15          | Assignable                                                                                                                                                                   | Cause:                                    |                                                                                                     |                          |  |  |  |
|             | Voltage requirements for the AFW lube oil pump motors were not in TVA procurement specification 1547.                                                                        |                                           |                                                                                                     |                          |  |  |  |
| 16          | Action Requ                                                                                                                                                                  | ired to Prevent Rec                       | currence:                                                                                           |                          |  |  |  |
|             |                                                                                                                                                                              |                                           | -E9.2-01 was issued on<br>e ratings. No other s                                                     |                          |  |  |  |
|             |                                                                                                                                                                              |                                           |                                                                                                     |                          |  |  |  |
|             |                                                                                                                                                                              |                                           | •                                                                                                   |                          |  |  |  |
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|             |                                                                                                                                                                              |                                           |                                                                                                     |                          |  |  |  |

**DIVISION OF ENGINEERING DESIGN** 0414 017 **NONCONFORMANCE REPORT** AEPORT NO. WENCEB8206 4 UNIT 1 and 2 PREPARER/ORGANIZATION/DATE Felpel/EN DES - CEB/4-13-82 6 DESCRIPTION OF CONDITION Digitized response spectra data used to qualify safety-related piping systems and possibly other components was prepared incorrectly. A computer program used to remove insignificant and extraneous data did not work properly and improperly altered it. This data included Seismic Excitation and Design Basis Accident information. 82072900033 DATE OF CCCURRENCE EST ( ), ACT. ( ) Unknown [1] ECN REQUIRED YES NO METHOD OF DISCOVERY Design-Data Review 2 SIGNIFICANT CONDITION ADVERSE TO QUALITY UNID CODE (EN DES-EP 8.01) TE SCHEDULE IMPACT DP When the expanded spectra curves were plotted, the peaks of some were not flat and slightly deviated from the horizontal. All of the WBN spectra curve data has been studied and the severest deviation found was less than 8 percent. Ten percent was judged acceptable. There was no need to correct any of the spectra data, and analysis results were not significantly affected. ASSIGNABLE CAUSE: (REQUIRED IF SIGNIFICANT) The analyst, using an interactive computer program, did not use the best judgement in removing digitized data from a spectra curve. Data was extracted so that the 100 point data base in the TPIPE computer program could be applied. LE ACTION REQUIRED TO PREVENT RECURRENCE: (REQUIRED IF SIGNIFICANT) The computer program and analysis technique are no longer being used. \*QA ENGINEER REVIEW AND CONCURRENCE 7.15.82 LABOR EST. ( ), ACT. ( ) 19 SCHEDULE EST. ( ), ACT. ( ) DAYS ACTIVITY NO. TARK DESCRIPTION DATE INITIATED REMARKS: DISTRIBUTION. 24 ALL ACTION COMPLETE: GER OA CROUP ENGINEERING SECTION Of 00 04 BRANCH CHIEF MAG ALBINES IF or Significant NCH's) . PINCA CLOSED. NERS (For 5 Indicent NCR's) QAS 820511 004 CHIEF, QUALITY ENGINEERING BRANCH DATE

OF PUSE

0727

004

G. D. Felpel

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"HANDCARRY COPY TO HEB-NLS ALSO

CER

## EEB830225906

## DIVISION OF ENGINEERING DESIGN NONCONFORMANCE REPORT

|                                                                                                                    |                         |            | 1                    | REPORT N  | o. WBI             | NEEB820   | 08                                            |
|--------------------------------------------------------------------------------------------------------------------|-------------------------|------------|----------------------|-----------|--------------------|-----------|-----------------------------------------------|
|                                                                                                                    |                         |            | 3 UNI                | TS 1 an   | d 2                |           |                                               |
| PLANT Watts Bar Nuclear                                                                                            | T. Perry/EEB/11-22      | 2-82       |                      |           |                    |           |                                               |
| PREPARER/ORGANIZATION/DATE L.                                                                                      | 1. Ferry/CCD/11-22      | 02         |                      |           |                    |           |                                               |
| DESCRIPTION OF CONDITION                                                                                           |                         |            | . :1: wy foe         | lwater Di | ımps'ar            | .6        |                                               |
| The electric motors on the aurequired to be Class 1E devinese motors were not purche environmentally qualified per | ased as Class 1E de     | evice:     | s and cannot be d    | -0588 gui | ideline<br>d to be | ?\$.<br>? |                                               |
|                                                                                                                    |                         |            |                      | •         |                    |           |                                               |
|                                                                                                                    |                         |            |                      |           |                    |           |                                               |
|                                                                                                                    |                         |            | 831                  | 3040      | 059                | 11 (      | Ś                                             |
|                                                                                                                    |                         |            |                      |           |                    |           |                                               |
|                                                                                                                    |                         |            |                      |           |                    |           |                                               |
| 6 DATE OF OCCURRENCE EST ( ), ACT. (                                                                               | (v) 11 22 82            | <b>9</b> S | IGNIFICANT CONDITION | DVERSE TO | QUALITY            |           |                                               |
| METHOD OF DISCOVERY Independe                                                                                      |                         |            | BRANCH CHIEF/DATE    | <u> </u>  |                    |           | <u>,                                     </u> |
| 8 UNID CODE (EN DES-EP 8.01) N/A                                                                                   | THE DESIGN NATION       | 109        | FILL CLICE LICE      | 1PR       | <u> </u>           | 2/24/8    | 3                                             |
| N/A See R <b>emarks</b> .                                                                                          | -                       |            |                      |           |                    |           |                                               |
|                                                                                                                    |                         |            |                      |           |                    |           |                                               |
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| (                                                                                                                  |                         |            |                      |           |                    | · .       |                                               |
| CORRECTIVE ACTION DEVIATES FRO                                                                                     | M A DESIGN CRITERIA REC | UIREM      | ENT YES              | NO 🗌      |                    |           |                                               |
| 14 00                                                                                                              |                         |            | EXCEPTION REQ        | JEST NO.  |                    |           |                                               |
| 13 DESIGN CRITERIA DOCUMENT NO.                                                                                    |                         |            | 15 SCHEDUL           |           | □ ?                |           |                                               |

|                |                                                                  | ·                 | NONCONFORMANCE REPOR    | it.                    | 1 REPORT NO.                          | BNEEB8203 |
|----------------|------------------------------------------------------------------|-------------------|-------------------------|------------------------|---------------------------------------|-----------|
| 18             | ASSIGNABLE CAUSE (REQUIRE                                        | O IF SIGNIFICANTI |                         | <del></del>            |                                       |           |
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| 17             | THIS IS A GENERIC CONDITION                                      | YES               | NO 🗍                    |                        |                                       |           |
| 8              |                                                                  |                   |                         | <del> </del>           |                                       |           |
| 의              | ACTION REQUIRED TO PREVENT                                       | RECUMMENCE. (R    | EQUIHED IF SIGNIFICANT) |                        |                                       |           |
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| 9              | *QA ENGINEER REVIEW AND CON                                      | ICURRENCE         |                         |                        |                                       |           |
| 0              | LABOR EST. ( ), ACT. ( )                                         |                   | MH 21 SCHEDULE          | EST. ( ), ACT (        | )                                     | . DA      |
| 3              | ACTIVITY NO.                                                     | 23 TASK DE        | SCRIPTION               |                        | 24 DATE INITIAT                       | ED        |
| 5              | REMARKS:                                                         |                   |                         |                        |                                       |           |
|                | This NCR has been refer                                          | red to MEB-fo     | r handling and res      | <del>Olution</del> per | EER.                                  |           |
| -              | This NCD closed because                                          | ding and re       | colution February       | <del>4, 1993.</del>    |                                       |           |
|                | This NCR closed because February 6, 1981.                        | tinis defici      | ency is covered by      | NCR WBNEER             | 8104 dated                            |           |
|                | •                                                                |                   |                         | •                      |                                       |           |
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|                | DISTRIBUTION.                                                    |                   | 26 ALL EN DES ACTION    |                        | Mandhe -                              | 2 ninulas |
| 8]             | CONST PROJECT MANAGER EN DES PROJECT MANAGER QAB                 |                   | -0 K                    | *8RA                   | NCH CHIEF/ORG                         | DATE      |
|                | OEDC QA                                                          |                   |                         |                        |                                       | -         |
| ./             | NEB (for Significant NCR's)** MEDS, NSRS (for Significant NCR's) |                   | <b>€</b> EB             | 83 02                  | 225 906                               | •         |
| i <sup>M</sup> | DISTRIBUTE APTER THIS SIGNA                                      | -K<br>NTURE       |                         |                        |                                       |           |
|                | ** HANDCARRY COPY TO NEB-NLS                                     | } <del>-</del>    | '                       |                        |                                       |           |

## EEB830225906

# NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

NCR NO. WBNEEB8208

SIGNIFICANT YES 🐼 NO C

REPORTABLE YES O

- A. Have any analyses, contracts, memorandums, etc., requiring EN DES work been , generated? Yes () No G If yes, list in (C) below.
- B. Have all ECNs related to the NCR been issued? N/A M Yes  $\Omega$  No  $\Omega$  If yes, list in (C) below.
- . Documents related to the NCR  $\pm$ ECN, analyses, memos, contract No., etc.)

STATUS

COMPLETE

REF OR MEDS ACCESS: NO. WORKING

(see (F) below)

N/A

Is action by organization outside EN DES required? Yes () No () Organization tracking No. (NCR, QCIR, etc.)

E. Has all necessary EN DES information been transmitted to an organization outside EN DES to enable the completion of work required? Yes □ No □ N/A Ø If yes, list in (C) above.

- F. If any document listed in (C) above is indicated in the working status block, item 26 on the NCR cannot be signed.
- G. Is all EN DES action complete? Yes ⋈ No G
- H. Remarks:

Deficiency already included in NCR WBNEEB8104.

Verified By & N Mandle Date 2/24/23

Page 1 of 1

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|          | NONCOHFORMANCE RE                                                                                                                                                    | PORT CEB 82 1112 008                           |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
|          |                                                                                                                                                                      | 1 REPORT NO. GENCEB8213                        |
| 2]       | PLANT Sequoyah, Watts Bar, Yellow Creek                                                                                                                              | 3 UNIT All                                     |
| _        | PREPARER/ORGANIZATION/DATE K. R. Spates/CEB/11-8-82                                                                                                                  | [3] 0411 1.22                                  |
| _        | DESCRIPTION OF CONDITION                                                                                                                                             |                                                |
| :        | The Sequoyah and Watts Bar FSARs and the Yellow Cree<br>i-percent eccentricity in the seismic analysis of an<br>commitments were not met in the analyses of the cont | disymmetric structures. These                  |
|          |                                                                                                                                                                      | 840111E0102 <b>6</b>                           |
| <u> </u> | METHOD OF DISCOVERY KEVIEW OF WEN CONTAINMENT                                                                                                                        | IGNIFICANT CONDITION ADVERSE TO QUALITY YES NO |
| 7        |                                                                                                                                                                      | BRANCH CHIEF/DATE                              |
|          | De his                                                                                                                                                               | Me 1/1/2/02                                    |
| 1        | CORRECTIVE ACTION:                                                                                                                                                   |                                                |
|          |                                                                                                                                                                      |                                                |
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|          |                                                                                                                                                                      |                                                |
| 3_       | CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMEN                                                                                                         |                                                |
| 3        | DESIGN CRITERIA DOCUMENT NO.                                                                                                                                         | EXCEPTION REQUEST NO.                          |
| 14       | ECN REQUIRED YES NO ECN NO.                                                                                                                                          | 18 SCHEDULE IMPACT   P A                       |

|          |                                                                        | W.              | Media character in  | PONT               |                    |                 |
|----------|------------------------------------------------------------------------|-----------------|---------------------|--------------------|--------------------|-----------------|
|          |                                                                        |                 |                     |                    | AEPORT NO.         |                 |
|          | ASSIGNABLE CAUSE: (REQUIRED                                            | IF SIGNIFICANT) |                     |                    |                    |                 |
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| ធា       | THIS IS A GENERIC CONDITION                                            | YES             | NO 🗌                |                    |                    |                 |
|          | ACTION REQUIRED TO PREVENT R                                           |                 |                     | AITS               |                    |                 |
| ص        |                                                                        | COUNTERUE: (MEC | duines ir SignificA | M ( )              |                    |                 |
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| 1g       | *QA ENGINEER REVIEW AND CONC                                           | :URRENCE:       |                     |                    |                    |                 |
| 20       | LABOR EST.( ), ACT.( )                                                 |                 | MH 21 SCHEDI        | ULE EST. ( ), ACT. |                    | D.A             |
| 77       | ACTIVITY NO.                                                           | 23 TASK DES     |                     |                    | 24 DATE INITIATED  |                 |
| 26       | REMARKS:                                                               |                 |                     |                    |                    |                 |
|          | This NCR has been supers SQN and WBN.                                  | eded by NCR (   | GENCEB8213 R1 (     | (CEB 830728 01     | 2) which separates | YCN from        |
|          |                                                                        |                 | •                   |                    |                    |                 |
|          |                                                                        |                 |                     | •                  |                    |                 |
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| <u></u>  |                                                                        | ··              | <b>2</b>            | 710H 00H2:         |                    |                 |
|          | DISTRIBUTION: CONST PROJECT MANAGER EN DES PROJECT MANAGER             | ·               | 26 ALL EN DES AC    | · Serie            | Burth 1            | 2/22/53         |
| 77<br>20 | DISTRIBUTION: CONST PROJECT MANAGER EN DES PROJECT MANAGER QAB OEDC GA | ·               | 28 ALL EN DES AC    | · Serie            | NOCH CHIEF JORG.   | 2/22/83<br>DATE |
| 72<br>20 |                                                                        | ·               | TAFL                | · Serie            |                    | 0ATE            |

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CEB '82 0707 010

## DIVISION OF ENGINEERING DESIGN NONCONFORMANCE REPORT

|     |                                                                                                                                                                  |       |          |                | 1 REPOR        | DT NO    | WBNCEB8    | 215   |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------|----------------|----------------|----------|------------|-------|
| [2] | PLANT WBN                                                                                                                                                        |       |          |                |                | and 2    |            |       |
| ā   | PREPARER/ORGANIZATION/DATE J. E. McCord/EN                                                                                                                       | DEC   | CER /S   | <u>_</u>       | UNIT           |          |            | -     |
| ভ   | DESCRIPTION OF CONDITION                                                                                                                                         | DES   | - CEB/5- | -5-82          |                |          |            |       |
|     |                                                                                                                                                                  |       |          | 840            | 40 <b>6</b> D( | 0029     | 13         |       |
|     | Operating Condition Data                                                                                                                                         |       |          |                |                |          |            |       |
|     | Attached.                                                                                                                                                        |       |          |                |                |          |            |       |
|     |                                                                                                                                                                  |       |          |                |                |          |            |       |
| i   |                                                                                                                                                                  |       |          |                | _              |          |            |       |
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|     | ,                                                                                                                                                                |       |          |                |                |          |            |       |
| 6   | DATE OF OCCURRENCE EST ( ), ACT. ( )                                                                                                                             | 9     | SIGNIFIC | ANT CONDITION  | ON ADVERSE     | TO QUALI | TY         |       |
| 7   | METHOD OF DISCOVERY                                                                                                                                              |       |          |                | vo 🗌           | 0 0 9    | 1/1        |       |
| 8   | UNID CODE (EN DES-EP 8.01)                                                                                                                                       | 10    | BRANCH   | CHIEF/DATE     | 75 NUT         | Zn o     | . () 13 au | nett. |
|     | Review analysis by implementation of a sample procedure and evaluate the difference betwee operational modes. The GEB Report $76-2$ will modes in a QA document. | n do  | cumentec | Laperatio      | nal mode       | s and ar | nalysis    |       |
|     |                                                                                                                                                                  |       |          |                |                |          |            |       |
|     |                                                                                                                                                                  | ٠     |          | •              |                |          |            |       |
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|     |                                                                                                                                                                  |       |          |                |                |          |            |       |
| 13  | CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQ                                                                                                            | UIREM | IENT     | YES []         | NO 🔀           |          |            |       |
| 12  | CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQU<br>DESIGN CRITERIA DOCUMENT NO.                                                                           | UIREM |          | YESXCEPTION RE | QUEST NO.      |          |            |       |

#### NONCONFORMANCE REPORT

REPORT NO WBNCFB8215

| 16 | ASSIGNABLE CAUSE | (REQUIRED IF | SIGNIFICANTI |
|----|------------------|--------------|--------------|
|    |                  |              |              |

The operational modes data used for piling system analyses in the unxiliary building at Watts Bar Nuclear Plant are not documented. The operational mode data for reactor building piping was generated by FDS Nuclear and is sued in Civil-Engineering Branch Report 76-2. In the above citéd cases, a procedure of not exist to assure that revised data was reviewed for effects on previous issued analysis.

| 17 | THIS IS A | GENERIC CO | NEUTION |
|----|-----------|------------|---------|

YES

## 18 ACTION REQUIRED TO PREVENT RECURRENCE (REQUIRED IF SIGNIFICANT)

Documents concerning operational modes will be maintained as retrievable requires in accordance with TVA's quality Assurance Program. When a reunalists is/require, this will require the operational modes to be reviewed and QA documented. Revision to the operational modes will cause the QA documents to be revised.

vo**⊠** 

| -  |                                        |               |                           |            |
|----|----------------------------------------|---------------|---------------------------|------------|
| 19 | ************************************** | INDEPENDENT   | REVIEW BROSER TORREST F 2 | 8= 12 31.6 |
| 20 | LABOR EST ( ), ACT, ( )                | мн [21]       | SCHEDULE EST ( ), ACT ( ) | DAYS       |
| 22 | ACTIVITY NO 23 TAS                     | K DESCRIPTION | 24 DATE INITIATED         |            |

#### 25 REMARKS

NCR was retyped on this form to meet the latest revision of EN DES-EP 1.26. This supersedes CEB 820507 007.

This NCR is superceded by NCR WBNCEB8215 R1, MEDS accession No. CE5 840307 003.

DISTRIBUTION:
CONST PROJECT MANAGER
EN DES PROJECT MANAGER
QAB
OEDC QA
NEB (for Significant NCR's)\*\*
MEDS
NSRS (for Significant NCR's)

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\*\* HANDCARRY COPY TO NEB-NLS

26 ALL EN DES ACTION COMPLETE

JAE

BRANCH CHIEF/ORG.

3/24/84 DATE

CEB'840326 007



The Quality Assurance Criteria 10 CFR50, Appendix B, section XVII, states, "Records shall be identifiable and retrievable." Also, section III states, "Measures shall be established for the identification and control of design interfaces and for coordination among participating design organizations." These measures shall include the establishment of procedures among participating design organizations for the review, approval, release, distribution, and revision of documents involving design interfaces.

The operating conditions used in piping analysis are based upon data requested from organizations outside of the Civil Engineering Branch (CEB). The thermal and seismic design basis "source" data is not in all cases identifiable as being current, valid data and in some cases is not available. No engineering procedure exists to control revisions to this data, i.e., assurance that the analysis is still valid for current operating conditions.

Also, piping analysis has been done by CER personal service contractors who have assumed that the data previously shown on the piping isometrics is still valid. They have signed off on the analysis checklist, item III, Checklist 1 - Geometry Check, 3. Isometrics, i (check that design and operating mode table is shown and correct) without verification that indeed it is still current and valid data.

The report which contains operating mode data for inside containment (CEB report 76-2) has not been maintained to reflect errors that have been observed in the data. As one example the report does not indicate the  $40^{\circ}$  F operating condition for analysis problems 9600200-02-05, -06, -07, -98, -95-91, and -92.

## DIVISION OF ENGINEERING DESIGN NONCONFORMANCE REPORT

CEB 83 0114 010

|    | (See "M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | OTE" in Block 25)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                      | 04117                 |             |               |
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| 2  | PLANT Watts Bar Nuclear Plant                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 3 UNIT               | T 1 and               | 2           |               |
| +  | PREPARETYONGANIZATION/DATE T. L. Paul/EM DES-                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | CEB/1-6-83                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0111                 | 24501                 | 20          |               |
| 1  | Description of CONDITION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0411                 | ZIEU4                 |             | (2            |
| لت | EM DES-EP 3.03 requires that design calculativolume, and be sent to MEDS. Some of the an requirement. An example is N3-62-9A.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ions be prepared,<br>alysis calculation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ns have              | , placed<br>not met t | in 4<br>his |               |
|    | Plange evaluations were omitted in some of t of this is the analysis calculation for N3-3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | he analysis calcu                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | lations.             | An exam               | ple         | 1             |
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| 6  | DATE OF OCCURRENCE EST (X), ACT. ( ) 1975                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 9 SIGNIFICANT CO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                      | OVERSE TO OL          | JALITY      |               |
| 7  | METHOD OF DISCOVERY Review                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 10 *BRANCH CHIEF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                      | 111.                  | <b>A</b>    | 1/2/~         |
| ĵ  | UNID CODE (EN DES-EP 8.01)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1 Semantin Chief                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                      | C. Beach              | Z //        | 13/8          |
| _  | CORRECTIVE ACTION:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 10                   |                       |             |               |
|    | Review all problems on WBN to ensure that a met. Review all analyses to ensure that the                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ll flange qualifi<br>ey are prepared,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | cation r<br>checked, | equiremen<br>and sent | to MEI      | s Deen<br>DS. |
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| j  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | The second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second secon |                      |                       |             |               |
| Į. | SCH REGURRED YES NO TO LON NO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | SCHEDULE             | HEACT                 |             |               |

NONCONFORMANCE REPORT REPORT NO. WENCEB8222 R1 ASSIGNABLE CAUSE: (REQUIRED IF SIGMFICANT) WBM piping analysis section was using preliminary data in the original issue of these rigorous analysis problems. These analyses were not documented according to the EM DES-EP 3.03 guidelines. It was the analysis section's intent that when a reanalysis was performed the preliminary data would be finalized and that the analysis calculations (including flange qualification) would be prepared, checked, and sent to MEDS. There was no system in existence that would have required these problems to be reviewed and reanalyzed. YES [ NO E 17) THIS IS A GENERIC CONDITION ACTION REQUIRED TO PREVENT RECURRENCE: (REQUIRED IF SIGNIFICANT) Issue a new section of the rigorous analysis handbook defining flange qualification requirements. Revise checklist to include flange qualification requirements. Conduct EN DES-EP training session instructing EN DES personnel of EN DES-EP 3.03 requirements. \$15/83 "INDEPENDENT REVIEW: Clouses Wanne 8-12-63 MH 21 SCHEDULE EST. ( ), ACT. ( ) DAYS LABOR EST. ( ), ACT. ( ) 24 DATE INITIATED ACTIVITY NO. TASK DESCRIPTION REMARKS: Changed N5-62-9A to be N3-62-9A. Added flange evaluation which are not found in all analysis calculations. This was discovered by Black and Vetch. 208 10/3/14 Veatch Note: This NCR was resubmitted to MEDS to complete block 3 which was inadvertently left blank. ALL EN DES ACTION COMPLETE: DISTRIBUTION: CONST PROJECT MANAGER EN DES PROJECT MANAGER CHIEF, ESS OFFICE OF CA NES (for Significa DATE \*BRANCH CHIEF/ORG. STANT TO THE MANAGER OF CEDC (Quality MENTE AFTER THIS SIGNATURE SCARRY COPY TO NESHLE

MEDS ACCESSION NO.

|            | NONCOMPOR                                                                                                                                                                                                                                                          | CEB '82 1129 00                                                                                                              |
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|            | · · · · ·                                                                                                                                                                                                                                                          | 1 REPORT NO. WENCE B8 232                                                                                                    |
| 2          | PLANT Watts Bar                                                                                                                                                                                                                                                    | 3 UNIT 8 1 and 2                                                                                                             |
| J          | PREPARER/ORGANIZATION/DATE COG Wagner/TPE-                                                                                                                                                                                                                         |                                                                                                                              |
| <b>9</b> j | The support design load of 1850 pounds in variable spring at node 133 is inaccurated 0600200-02-05 have an overlap region with analysis confirms nor is within 10 percent the NCR was caused probably while transpot to the support load table and was not caused. | h the inclusion of node 133. Neither<br>nt of the recorded support design value.<br>osing numbers from the computer printout |
|            |                                                                                                                                                                                                                                                                    | 84040680912                                                                                                                  |
|            |                                                                                                                                                                                                                                                                    |                                                                                                                              |
| 3)         | DATE OF OCCURRENCE EST ( X ), ACT. ( ) 1/82                                                                                                                                                                                                                        | significant condition adverse to quality                                                                                     |
| 5          | METHOD OF DISCOVERY Black & Veatch Review                                                                                                                                                                                                                          | ── YE8  NO[X                                                                                                                 |
| Ų.         | mainte of blood terr brack & veatch keview                                                                                                                                                                                                                         |                                                                                                                              |
|            | UNID CODE (EN DES-EP 8.01)  CORRECTIVE ACTION:                                                                                                                                                                                                                     | ** SPRANCH CHIEF/DATE LOCKINGH 11/2                                                                                          |
|            | UNID CODE (EN DES-EP 8.01)                                                                                                                                                                                                                                         | proper lapping techniques used in eanalyzed following the WBN Rigorous                                                       |
|            | CORRECTIVE ACTION:  An evaluation of the deficiency exposed improblem 0600200-02-05. The analysis was reallysis Handbook, section 200, which explain                                                                                                               | proper lapping techniques used in eanalyzed following the WBN Rigorous                                                       |
|            | CORRECTIVE ACTION:  An evaluation of the deficiency exposed improblem 0600200-02-05. The analysis was reallysis Handbook, section 200, which explain                                                                                                               | proper lapping techniques used in eanalyzed following the WBN Rigorous                                                       |
|            | CORRECTIVE ACTION:  An evaluation of the deficiency exposed improblem 0600200-02-05. The analysis was reallysis Handbook, section 200, which explain                                                                                                               | proper lapping techniques used in eanalyzed following the WBN Rigorous                                                       |
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|            | CORRECTIVE ACTION:  An evaluation of the deficiency exposed improblem 0600200-02-05. The analysis was ranalysis Handbook, section 200, which explains work was performed under ECN 3511.                                                                           | proper lapping techniques used in eanalyzed following the WBN Rigorous ains proper lapping techniques.                       |

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|          |                                                                                     |           |          | ONEGHPORM           | ANCE REPORT | •            | T REPORT NO. |             | ·                       | _          |
| 3        | ASSIGNABLE CAUSE: (REQUIRED II                                                      | F SIGNIFI | CANT)    |                     | ·           |              |              |             |                         | •          |
|          | ·                                                                                   |           |          |                     |             |              |              |             |                         |            |
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| <u>1</u> | THIS IS A GENERIC CONDITION                                                         | Y         | ES 🗌     | NO 🗌                |             |              |              |             |                         |            |
|          | ACTION REQUIRED TO PREVENT RE                                                       | ECURREN   | ICE: (RE | QUIRED IF S         | IGNIFICANT) |              |              |             |                         |            |
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| 3        | Ara enrinsongemenonderson                                                           |           |          | NDEPEN DEN          | T REVIEW:   | کام مالا     | W. Pipe      | μ×          | <i>8:1</i> 42           | <b>5</b> . |
|          | RRA ENSINGONOSIMENONO: SONOSI<br>LABOR EST. ( ), ACT. ( )                           | NASEROG   | KX II    | NDEPENDEN<br>MH [2] | <u>`</u>    | Don & 1      |              | μ~          | <u>8-78-</u>            | <b>S</b> . |
|          |                                                                                     | T ==      |          | <del></del>         | <u>`</u>    |              | W. Pige.     | JA ~        | <b>8-18-</b>            | <u></u>    |
|          | LABOR EST. ( ), ACT. ( )                                                            |           |          | MH 21               | <u>`</u>    |              |              | AATED       | 7 <u>8-7</u> 4-         | 8.         |
| Į        | LABOR EST. ( ), ACT. ( ) ACTIVITY NO.                                               |           |          | MH 21               | <u>`</u>    |              |              | <b>JA</b>   | <b>8-21-</b><br>D/      | <b>8</b> . |
| Į        | LABOR EST. ( ), ACT. ( ) ACTIVITY NO.                                               |           |          | MH 21               | <u>`</u>    |              |              | μ~<br>NATED | <b>8-24-</b>            | A.         |
|          | LABOR EST. ( ), ACT. ( ) ACTIVITY NO.                                               |           |          | MH 21               | <u>`</u>    |              |              | μ~<br>NATED | <u>8.72.</u>            | A.         |
|          | LABOR EST. ( ), ACT. ( ) ACTIVITY NO.                                               |           |          | MH 21               | <u>`</u>    |              |              | JATED       | <b>8-24-</b><br>DA      | A.         |
|          | LABOR EST. ( ), ACT. ( ) ACTIVITY NO.                                               |           |          | MH 21<br>SCRIPTION  | <u>`</u>    |              |              | μ~<br>NATED | <b>8-24-</b>            | A.         |
|          | LABOR EST. ( ), ACT. ( ) ACTIVITY NO.                                               |           |          | MH 21<br>SCRIPTION  | <u>`</u>    |              |              | IATED .     | 78.72.2.<br>D/          | A.         |
|          | LABOR EST. ( ), ACT. ( ) ACTIVITY NO.                                               |           |          | MH 21<br>SCRIPTION  | <u>`</u>    |              |              | IATED       | <b>8-28-</b>            | A          |
|          | LABOR EST. ( ), ACT. ( ) ACTIVITY NO.                                               |           |          | MH 21               | SCHEDULE ES | T.( ), ACT.( |              | μ~<br>NATED | <b>B</b> - <b>23</b> -2 | A)         |
|          | LABOR EST. ( ), ACT. ( ) ACTIVITY NO. REMARKS:                                      |           |          | MH 21<br>SCRIPTION  | <u>`</u>    | COMPLETE:    | 24 DATE INIT | PATED.      | <u>8.7</u> 2.           |            |
|          | LABOR EST. ( ), ACT. ( ) ACTIVITY NO. REMARKS:  DISTRIBUTION: CONST PROJECT MANAGER |           |          | MH 21               | SCHEDULE ES | COMPLETE:    |              | JATED .     | 8-24-<br>DA             |            |
|          | DISTRIBUTION: CONST PROJECT MANAGER EN DES PROJECT MANAGER GAS OSOC GA              |           |          | MH 21<br>SCRIPTION  | SCHEDULE ES | COMPLETE:    | 24 DATE INIT | IATED       | 4/2/8                   |            |
|          | LABOR EST. ( ), ACT. ( ) ACTIVITY NO. REMARKS:                                      |           |          | MH 21<br>SCRIPTION  | SCHEDULE ES | COMPLETE BRA | 24 DATE INIT | IATED .     | 4/2/8                   |            |

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## NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

## NCR NO. WANCEBB232

SIGNIFICANT YES D NO M

REPORTABLE
YES D NO M

- A. Have any analyses, contracts, memorandums, etc., requiring EN DES work been generated? Yes O No M If yes, list in (C) below.
- B. Have all ECNs related to the NCR been issued? N/A □ Yes 其 No □ If yes, list in (C) below.

· item 26 on the NCR cannot be signed.

H. Remarks:

G. Is all EN DES action complete? Yes ★ No □

C. Documents related to the NCR (ECN, analyses, memos, contract No., etc.)

|    |                                                                                                   |                            | STATU                                 | <u>s</u>    |
|----|---------------------------------------------------------------------------------------------------|----------------------------|---------------------------------------|-------------|
|    |                                                                                                   | REF OR MEDS<br>ACCESS. NO. | WORKING (see (F) below)               | COMPLETE    |
|    | ECN 3511                                                                                          | WBP840321526               |                                       | ~           |
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| D. | Is action by organization outside: Organization tracking No. (NCR, QC                             | EN DES required?           | Yes 🗆 No 📜                            |             |
| Ε. | Has all necessary EN DES informations outside EN DES to enable the complyes O No NAM If yes, list | etion of work requi        | d to an organizati<br>ired?           | on          |
| F. | If any document listed in (C) above                                                               | e is indicated in          | the working status                    | block,      |

Verified By Roger Ariffith Date 3-26-84

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| :  |                                                                                                                                                                                                                                                                                                                                | 1 REPORT NO. VEHCEB6233                          |  |  |  |  |  |  |
| 3  | PLANT Watts Bar                                                                                                                                                                                                                                                                                                                | 3 UNIT 1                                         |  |  |  |  |  |  |
| 4  | PREPARER/ORGANIZATION/DATE C C VAgner/TPE-CE                                                                                                                                                                                                                                                                                   |                                                  |  |  |  |  |  |  |
| O  | DESCRIPTION OF CONDITION                                                                                                                                                                                                                                                                                                       |                                                  |  |  |  |  |  |  |
|    | Problems N3-3-13A and N3-3-14A are unit 1 and 2 analyses. The unit 1 anchor design for nodes 14C, 295, and 310 does not have calculations to support the anchor load tables. The present anchor load tables are nonconservative. This may not be the only occurrence of this situation, hence further investigation is needed. |                                                  |  |  |  |  |  |  |
|    |                                                                                                                                                                                                                                                                                                                                | 840227C0150                                      |  |  |  |  |  |  |
|    |                                                                                                                                                                                                                                                                                                                                |                                                  |  |  |  |  |  |  |
| H  | DATE OF OCCURRENCE EST ( N, ACT. ( ) 1/80                                                                                                                                                                                                                                                                                      | SIGNIFICANT CONDITION ADVERSE TO QUALITY YES NO  |  |  |  |  |  |  |
| 붜  | METHOD OF DISCOVERY Black & Veatch Review UNID CODE (EN DES-EP 8.01)                                                                                                                                                                                                                                                           | BRANCH CHIEF/DATE MAL MA MAR                     |  |  |  |  |  |  |
| س  | ONIO CODE (EN DES-EF 8.01)                                                                                                                                                                                                                                                                                                     | 1/1/82 1/1/1/82                                  |  |  |  |  |  |  |
| 11 | corrective action: GENCEB8302 was written to acresult of this generic NCR, all anchor loads the above-stated deficiency will have the anarevised anchor program.                                                                                                                                                               | s on WBN will be rerun and documented. Therefore |  |  |  |  |  |  |
|    |                                                                                                                                                                                                                                                                                                                                |                                                  |  |  |  |  |  |  |
|    |                                                                                                                                                                                                                                                                                                                                | •                                                |  |  |  |  |  |  |
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|    |                                                                                                                                                                                                                                                                                                                                |                                                  |  |  |  |  |  |  |
| 12 | CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQ                                                                                                                                                                                                                                                                          | DUIREMENT YES NO                                 |  |  |  |  |  |  |
| 13 | DESIGN CRITERIA DOCUMENT NO.                                                                                                                                                                                                                                                                                                   | EXCEPTION REQUEST NO.                            |  |  |  |  |  |  |
| 14 | ECN REQUIRED TYPES NOT ECN NO. 3511                                                                                                                                                                                                                                                                                            | 13 SCHEDULE IMPACT P A D                         |  |  |  |  |  |  |

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| a requirem                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ME CAUSE: MEQUINED IF<br>ment of the analysi<br>always readily ava-                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | it. As a resu                                                                                                                | Microfiled<br>ult, calcul                                    |                                                                                                | opert the                                                   |                                                    |                                |
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| 2. If one analyze analyze 3. If one analyze for the Documer microf                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | th sides of the anche filed with the act side of the anche ted, the microfilme ted side.  e side of the anche ted, anchor loads we loads on that an entation EN DES-EP filming of anchor loads.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | analysis prob<br>or is alterna<br>ed anchor loa<br>or is CEB alt<br>will be tabul<br>nalysis are m<br>3.56 will ha<br>loads. | olem that wately analy and printout cernately a lated for be | vas last rear<br>vzed and the<br>will be fil<br>analyzed and<br>both sides on<br>d and referen | nalyzed.  other side led with the  the other s n separate t | is rigorous rigorousl side is rigorousl tables. Do | gorously ocumentation problem. |
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| ACTIVITY N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 23 TASK DESCR                                                                                                                |                                                              | HEDULE CS1.1                                                                                   |                                                             | DATE INITIATE                                      | ED.                            |
| This NCR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | R is superceded by                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | NCR WBNCEB82                                                                                                                 | :33 R1, MEC                                                  | )S accession                                                                                   |                                                             |                                                    |                                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                              |                                                              |                                                                                                |                                                             |                                                    |                                |

CEB'84 0 2 0 9 0 0 8

\* DISTRIBUTE AFTER THIS SIGNATURE \*\* HANDCARRY COPY TO NEB-NLS

850503E0038

# DIVISION OF ENGINEERING DESIGN NONCONFORMANCE REPORT

MEDS Assessed No.

1 ASPORT NO. WENSWP8252 R3

| <u> </u>   | PLANT WATTS BAR NUCLEAR "LANT 3 UNIT 1 4 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |  |  |  |  |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|
| <u> </u>   | PREPARER/ORGANIZATION/DATE N. F. Consumo/CEB/April 18, 1985                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |
| *          | DESCRIPTION OF CONDITION Unit 1  During the past several months a number of NCRs have been written against various aspects of alternately analyzed piping. This NCR is written to consolidate the appropriate NCRs plus any other nonconforming items found during TVA's program to verify qualification/requalification of WBN piping supported in accordance with the WFN Alternate Analysis Criteria (CEB 76-5). This NCR will be used for consolidation reporting of the above mentioned program. The previously identified NCRs totally included in this NCR are:  WBNSWP8220 - Alternate analysis not properly documented. No WBP engineering procedure to control alternate analysis  WBNSWP8231 - Technical deficiencies in analysis  WBNSWP8231 - Flanged joints not analyzed  WBNSWP8160 - Interface between alternately analyzed piping and deadweight supported piping not correctly analyzed  WBNSWP8306 - Use of CEB 76-5 to analyze aluminum piping. This piping is not within |  |  |  |  |  |  |
| <u> </u>   | Continued on Attachment) & VENDOR NAME & GONTRACT NO  DATE OF OCCURRENCE EST (X), ACT. ( ) 1_76                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |  |  |  |  |
| <u>同</u>   | METHOD OF DISCOVERY Design Review                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |  |  |  |  |  |
|            | UNID CODE (EN DES-EP 8.01) N/A *** T- A A 45                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |  |  |
| <b>h1a</b> | CORRECTIVE ACTION: The corrective action for these conditions is a 100-percent verification of all WBN piping supported by alternate analysis methods. This verification program involves piping in the scope of responsibility of OEB and WBP. Included in WBP's scope is piping for which WBN CONST located supports in accordance with drawing series 47A053 (for process pipes), 47A051 and 052 (for instrument lines) and 47A054 (for con rol air lines). These drawings provide guidelines for locating and supporting seismic supports.  EN DES-SEP 82-18 Program for Alternate Analysis Fix - Coordinating, Documenting,                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  |  |
|            | and Verifying, was written to control the verification program for processing piping within WBP's scope. CEB's verification was performed in accordance with their normal analysis procedures. Instrument and control air line qualification was determined by separate calculations by CEB (CEB 830914 001). In all cases, WBP verifies all supports as adequate or corrects them by revised drawings under ECN 3213 (engineered supports) or variances (typical supports).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |  |  |
|            | (Continued on Attachment)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |  |  |
| in a       | ICHEDULED DATE OF COMPLETION:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |  |  |  |  |  |
| 12         | CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES NO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |  |  |  |  |
| 10         | DESIGN CRITERIA DOCUMENT NO. EXCEPTION REQUEST NO.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |  |  |  |  |
| 14         | SCN REQUIRED X YES NO ECN NO. 3213, 3542 18 SCHEDULE IMPACT P X A N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |  |  |  |  |  |
|            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |  |  |  |  |

|               |                                                              |                         | NFORMANCE REPORT                             | ASPORT NO.                             | /BHSVP8252 RJ      |
|---------------|--------------------------------------------------------------|-------------------------|----------------------------------------------|----------------------------------------|--------------------|
| 12            | ASSIGNABLE CAUSE: IREQUIRED IF                               | SIGNIFICANT)            |                                              |                                        |                    |
|               | The following items have                                     | been ident              | ified as causes of th                        | ese deficiencies                       |                    |
|               | 1. Pailure to provide a 2. Failure to provide a              | idequate ana            | lunda                                        |                                        |                    |
|               |                                                              |                         |                                              |                                        |                    |
| 삘             | POTENTIAL GENERIC CONDITION REV                              |                         |                                              | vo 🗌                                   |                    |
| <b>-</b>      | ACTION REQUIRED TO PREVENT REC                               | URRENCE: (REQL          | JIRED IF SIGNIFICANT)                        |                                        | <del></del>        |
|               | See attached sheet.                                          |                         |                                              |                                        |                    |
|               |                                                              |                         |                                              |                                        |                    |
|               |                                                              |                         |                                              |                                        |                    |
|               |                                                              |                         |                                              |                                        |                    |
|               |                                                              |                         | •                                            |                                        | -                  |
|               | •                                                            |                         |                                              |                                        |                    |
| 186           | SCHEDULED DATE OF COMPLETION:                                |                         | •                                            |                                        |                    |
| $\overline{}$ |                                                              |                         |                                              |                                        | ·                  |
| 201           | W, /, /.                                                     | lest                    |                                              |                                        |                    |
| 岩             |                                                              | МН                      | 21 SCHEDULE EST.( ), ACT. (                  | )                                      | DAYS               |
| <u> </u>      | ACTIVITY NO.                                                 | 23 TASK DESC            | RIPTION                                      | 24 DATE INITIATED                      |                    |
| 25            | REMARKS                                                      |                         |                                              | <u> </u>                               |                    |
|               | Revised corrective action that most of the Unit 2 panalysis. | and action iping is be: | required to prevent<br>ing analyzed using si | recurrence to inc<br>mplified (T-pipe) | licate<br>computer |
|               |                                                              |                         |                                              |                                        | ·                  |
|               |                                                              |                         |                                              |                                        |                    |
| 27            |                                                              |                         |                                              |                                        |                    |
| 28            | DISTRIBUTION: CONST PROJECT MANAGER EN DES PROJECT MANAGER   | į                       | 25 ALL EN DES ACTION CO                      | MPLETE:                                |                    |
|               | Chief, esb<br>Office of QA                                   |                         | *BRANCH CHIEF                                | /ORG .                                 | DATE               |
|               | MEDS CIS EN DES MANAGER (for significant NCR                 |                         |                                              |                                        | = × · · · •        |
|               | NEB Ifor Significant NCRs)** NSRS (for Significant NCRs)     | ıs                      |                                              |                                        |                    |
| ••            | HISTRIBUTE AFTER THIS SIGNATURE                              |                         | MED                                          | E ACCESSION NO.                        |                    |

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#### ATTACHMENT

### Sa. DESCRIPTION OF CONDITION

#### HCR VAHINDASSE 13

WENSWP8306 - the scope of CRB 76-5
WENSWP8311 - Use of CRB 76-5 to analyse schedule 108 stainless
stril piping. This piping not within the scope of
CRB 76-5

\* Partially included in this MCR (last sentence only).

#### 11. CORRECTIVE ACTION

#### HCR VBHSWP8252 R3

#### Unit 1

CRB 76-5 has been revised to clarify some areas of the criteria and provide guidelines in others. However, in order to minimize additional field work the verification of qualification of the piping is normally evaluated against code requirements instead of solely CRB 76-5. The verification methods utilize hand calculations as well as computer analysis to qualify piping analyses which do not meet the specific rules of CRB 76-5.

The majority of the WBP corrective action on Unit 1 was carried out by a Personal Services Contractor; however, some was performed by WBP personnel.

### Unit 2

At present, there is no remaining alternate analysis work using CEB 76-5 to be done under this MCR. Some Unit 2 analyses have been qualified using the action described above for Unit 1. This work is presently complete.

For the remaining Unit 2 piping, a simplified (T-pipe computer) analysis will be used rather than CEB 76-5.

### 18. ACTION REQUIRED TO PREVENT RECURRENCE:

#### Unit 1

 CEB 76-5 has been revised to clarify some areas and provide guidelines in some previously unaddressed areas. Portions of SWP EP 43.21, Alternate Analysis Piping Systems - Documenting and Verifying, address various technical areas. The 47A053 drawings have been revised (under ECN 3542) to clarify some areas and to require all piping supported in accordance with these notes to be reviewed by WBP.

- MY EP 43.21 has been issued to control the analysis of alternately analyzed piping in WEP's scope. In the future CEB will not analyze WEH piping by alternate analysis. Any reanalysis of their current alternate analysis problems will be simplified (T-pipe).
- 3. Training in alternate analysis methods has been provided to WBP and COMST personnel. The subjects of these training sessions were CEB 76-5, SWP EP 43.21, and the 47A053 drawings as appropriate.

#### Unit 2

Although the actions stated for Unit 1 above are applicable to some Unit 2 problems, the majority of the Unit 2 problems are being analyzed using simplified (T-pipe computer) analysis. In the future, CEB will not analyze WBM piping by CEB 76-5 alternate analysis. Any reanalysis of Unit 1 alternate analysis problems or new analysis problems will be done by simplified (T-pipe) analysis.

MEDS ACCESSION NO 183 0224 026

|                                                                                                                                | THEPOHENO WENSHIPE OF                       |
|--------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| 2 PLANT WATTS BAR NUCLEAR PLANT                                                                                                | is unit 1                                   |
|                                                                                                                                | P/February 22, 1983                         |
| 6 DESCRIPTION OF CONDITION                                                                                                     |                                             |
| Auxiliary feedwater pipe support 1-03B-73 global "Z" direction as required by load tidertified by Black & Veatch Finding F-364 | able 478427-500 RL. This condition was      |
|                                                                                                                                | 840214F0255 (2)                             |
| . *                                                                                                                            |                                             |
|                                                                                                                                |                                             |
| B DATE OF OCCURRENCE EST (X ), ACT ( ) 11/8/82                                                                                 | 19 SIGNIFICANT CONDITION ADVENSE TO QUALITY |
| [] METHOD OF DISCOVERY Black & Veatch Review                                                                                   | 418 \$ 100                                  |
| 8 UNID CODE (EN DES EP 8 01)                                                                                                   | 10 BHANCH CHIEF DATE ( Alfre for 2/2 3/15   |
|                                                                                                                                |                                             |
| [11] CORRECTIVE ACTION                                                                                                         |                                             |
|                                                                                                                                |                                             |
| N/A                                                                                                                            |                                             |
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|                                                                                                                                |                                             |
| 12 CORRECTIVE AS LION DEVIATES FROM A 14 Section Of Terra Res                                                                  | CHURCH AND NOT                              |
| 13] UESIGN CHILDRIA DOCUMENT NO                                                                                                | EXCEPTION PEODEST NO                        |
| 14 ECN RECORDED CONTRACTOR NO.                                                                                                 | [15] SCHEOULE IMPACT                        |
|                                                                                                                                |                                             |

|                                                                           | NONCONFORMANCE R                         | EPORT                  | · · · · · · · · · · · · · · · · · · · | VBNSWP8262  |
|---------------------------------------------------------------------------|------------------------------------------|------------------------|---------------------------------------|-------------|
|                                                                           |                                          |                        | 1) REPORT NO                          | #B#2#10***  |
| M ASSIGNABLE CAUSE IREQUIRED IN                                           | SIGNIFICANTI                             |                        |                                       |             |
|                                                                           |                                          |                        |                                       |             |
| •                                                                         |                                          | ^                      |                                       |             |
| N/A                                                                       |                                          |                        |                                       |             |
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|                                                                           |                                          |                        |                                       |             |
|                                                                           |                                          |                        |                                       |             |
| 1. THIS IS A GENERIC CONDITION                                            | YES NO                                   | <del></del>            |                                       |             |
| <del></del>                                                               | YES NO CURRENCE IREQUIRED IF SIGNIFICANT |                        | <del></del>                           | ·           |
|                                                                           | CHRENCE INEQUIRED IF SIGNIFICANT         | 1                      |                                       |             |
|                                                                           |                                          |                        |                                       |             |
| •                                                                         |                                          |                        |                                       |             |
| N/A                                                                       | •                                        |                        |                                       |             |
| •                                                                         |                                          |                        |                                       |             |
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|                                                                           |                                          |                        |                                       |             |
| 19 INDEPENDENT REVIEW                                                     |                                          |                        |                                       |             |
| 20 LABOR EST ( ), ACT ( )                                                 |                                          | EST ( ), ACT ( )       | T                                     | DAYS        |
|                                                                           | 23 TASK DESCRIPTION                      |                        | 24 DATE INITIATI                      |             |
| Veatch review. Revision 903                                               | of the associated banger                 | as a nonconfo          | rmance during                         | the Black 5 |
| for the "%" direction moveme                                              | ent required by load table               | 47 <b>B</b> 427-500 R1 | . but the phys                        | ical        |
| modification of the hanger h                                              | had not been completed by O              | ONST at the t          | ime of the rev                        | iew.        |
| This information was noted i                                              | in the disposition of Black              | & Veatch fine          | ding F-364.                           |             |
|                                                                           |                                          |                        |                                       |             |
|                                                                           |                                          |                        |                                       |             |
|                                                                           |                                          |                        |                                       |             |
|                                                                           | ř                                        | -                      |                                       |             |
| DISTRIBUTION                                                              |                                          | To an swass            |                                       | <del></del> |
| CONST PROJECT MANAGER EN DES PROJECT MANAGER                              | D. W. Owen, 3117 GB-K                    | 26 ALL EN DES          | ACTION COMPLETE                       |             |
| CHIEF, ESB                                                                |                                          | 000                    | -10                                   | -11-4       |
| OFFICE OF QA NEB (for Significant NCRs)**                                 |                                          |                        | HA F                                  | - 4488      |
| MEDS CIS<br>NSRS (for Significant NCRI)*                                  |                                          | BRANCH                 | CHIENORG.                             | DATE        |
| ASSISTANT TO THE MANAGER OF O<br>and Nuclear Safety) - for Significant No | EDC (Quality                             | WBP                    | '94 0204                              | ′ 012       |
| DISTRIBUTE AFTER THIS SIGNATUR                                            | RE .                                     | , (MI                  | '84 0206                              | 012         |
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MEDS Accession No SWP '83 0110 125

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 11 REPORT NO WBNSWP8272                                                                                                           |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| 7              | PLAN! - Watts Bar Nuclear Plant                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | (3' UNIT ]                                                                                                                        |
| <del></del>    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                   |
| <del>=</del> - | PREPARER ORGANIZATION/DATE J. R. Holloway/SSP/<br>DESCRIPTION OF CONDITION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | January 10, 1963                                                                                                                  |
|                | Support 038-1AFW-R221 Rev 903 was not designed to the support should be support should be support should be support should be supported by the support should be supported by the support should be supported by the support should be supported by the support should be supported by the support should be supported by the support should be supported by the support should be supported by the support of the support should be supported by the support should be supported by the support should be supported by the support should be supported by the support should be supported by the support should be supported by the support should be supported by the support should be supported by the support should be supported by the support should be supported by the support should be supported by the support should be supported by the support should be supported by the support should be supported by the support should be supported by the support should be supported by the support should be supported by the support should be supported by the support should be supported by the support should be supported by the support should be supported by the support should be supported by the support should be supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the supported by the suppo | Id be allowed to move thermally in the X  Sirection. However, the support is restrained  Il not allow the required movement. This |
|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 840406D0066 3                                                                                                                     |
|                | ·                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | -                                                                                                                                 |
| 6              | DATE OF OCCURRENCE EST (X.), ACT ( ): 4/21/82                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 9 SIGNIFICANT CONDITION ADVERSE TO QUALITY                                                                                        |
| <b>-</b> ; -   | METHOD OF DISCOVERY Black and Veatch Review UNID CODE (EN DES FP 8 0) N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 10 BRANCH CHEF. DATE EUCh 1/10/83                                                                                                 |
|                | movements in the X and Z directions required 4.7-83.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 03 has been redesigned to allow the thermal<br>by load table 47B427-469 RO. Drawing issued                                        |
|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                   |
|                | ,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                   |
| 12             | CORRECTIVE A TWO DEVIATES FROM A DESIGN CRITERIA REV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | OPEMENT OF THE TOTAL NO. (X)                                                                                                      |
| 12 13          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                   |

and the second of the second

|          | NONCONFORMANCE F                                                                                                                                                                                                                   | REPORT                                                        | 1 REPORT NO,                    | WBNSWP8272               |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------|--------------------------|
| 16       | ASSIGNABLE CAUSE FREQUIRED IF SIGNIFICANTI                                                                                                                                                                                         |                                                               |                                 |                          |
|          | Original designer inadvertantly neglected thermal was-an-isolated-incidence-of-individual error work allowed the support to be released with error                                                                                 | lso, inadequat                                                | design of supple checking of    | oort. This<br>the design |
|          |                                                                                                                                                                                                                                    |                                                               |                                 |                          |
|          |                                                                                                                                                                                                                                    |                                                               | :                               |                          |
| <u>"</u> | THIS IS A GENERIC CONDITION YES NO EX                                                                                                                                                                                              |                                                               |                                 |                          |
| 18       | Pipe support designers have been trained since reduse of the Pipe Support Design Manual which has gumovement. (See SWP 820714 011 for training roster in EN DES-EP 4.25 "Design Review and Interface Codand Procurement Drawings." | or <del>ganization o</del><br>uidelines on h<br>r.) Designers | ow to allow fo<br>also received | 82 in the r thermal      |
| 19       | INDEPENDENT REVIEW R.J. Pratt 2/24/84                                                                                                                                                                                              |                                                               |                                 |                          |
|          |                                                                                                                                                                                                                                    | EEST ( ), ACT ( )                                             | N/A                             | DAYS                     |
| 22<br>25 | ACTIVITY NO. : J/A 23 TASK DESCRIPTION A                                                                                                                                                                                           | VIA                                                           | 24 DATE INITIAT                 | ED N/A                   |
|          | Additional corrective action by CONST is                                                                                                                                                                                           | being tracked                                                 | by ECN 3511.                    |                          |
| 27 D     | ISTRIBUTION J. R. Holloway, 3109 GB-K                                                                                                                                                                                              | 26 ALL EN DES                                                 | ACTION COMPLETE:                |                          |
| <b></b>  | EN DES PROJECT MANAGER CHIEF, ESB OFFICE OF QA NEB (for Significant NCRs)** MEDS CIS NSRS (for Significant NCRs)* ASSISTANT TO THE MANAGER OF OEDC (Quality and Nuclear Safety): for Significant NCRs                              |                                                               | CHIEF/ORG                       | 3-28-84<br>DATE          |
|          | DISTRIBUTE AFTER THIS SIGNATURE HANDCARRY COPY TO NEB NLS                                                                                                                                                                          | MEB '84                                                       | 10328 C                         | 175                      |
|          |                                                                                                                                                                                                                                    | 1 ,                                                           | MEDS ACCESSION NO               |                          |

MEB 840328 012 MEDS ACCESSION NO.

## EN DES NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

### NCR NO. WBNSWP8272

SIGNIFICANT YES 🛼 NO 🗆

REPORTABLE
YES D NO E

- A. Have any analyses, contracts, memorandums, etc., requiring EN DES work been generated? Yes M No  $\square$  If yes, list in (C) below.
- B. Have all ECNs related to the NCR been issued?

  N/A□ Yes A No□ If yes, list in (C) below.
- C. Documents related to the NCR (ECN, analyses, memos, contract No., etc.)

|                           |                                                            | REF OR MEDS<br>ACCESS. NO.                                    | COMPLE                                | TION DATE     |
|---------------------------|------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------|---------------|
| ECN 35                    |                                                            | WBP840321525                                                  | 3/21/8                                | 34            |
| PIPE SUP                  | PORT DRAWING                                               | 038-1AFW-R221 R9                                              | 03 4/7                                | /83           |
| PIPE SUPP                 | BRT ANALYSIS                                               | WBP 830822 078                                                | •                                     |               |
|                           |                                                            |                                                               | · · · · · · · · · · · · · · · · · · · | <del></del>   |
|                           |                                                            |                                                               |                                       |               |
|                           |                                                            |                                                               |                                       |               |
| . Is action<br>Organizati | by organization outsic<br>on tracking No. <u>EC</u> N      | de EN DES required? Ye                                        | s 🗷 No 🗅                              |               |
| outside EN                | cessary EN DES informa DES to enable the con N/A If yes, 1 | tion been transmitted opletion of work requires in (C) above. | to an organi<br>ed?                   | zation        |
| . Is all EN               | DES action complete?                                       | Yes ≇ No □                                                    |                                       |               |
| . Remarks:                |                                                            |                                                               |                                       |               |
|                           |                                                            | Verified By                                                   | Jord                                  | Date \$26 /84 |

Page <u>|</u> of <u>|</u>

TVA 10700A (EN DES--12/83)

**MEDS Accession No** 

SWP '83 0111 035

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                       | 3   |  |  |  |  |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--|--|--|--|
| 2 PLA                           | NT UATTE DAD MINT DAD DI AND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | I REPORT NO. WENSWP827                                                                                                                                                |     |  |  |  |  |
|                                 | WATTS DAR NOCHEAR TEART                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | [3] UNIT 162                                                                                                                                                          |     |  |  |  |  |
| -                               | R. L. Ilich/SWP/J                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                       |     |  |  |  |  |
|                                 | Substitution of fillet welds as allo was found to be inadequate. The ser                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | wed by General Note 3 on TVA drawing vice load capacity of 1-1/4-inch wedge bolts, pacity exceed the capacity of a 5/16-inch this note.                               | )   |  |  |  |  |
|                                 | The above condition represents a situation which, if it had not been detected, may result in the inability of pipe supports installed by this note to accomplish their safety function. This condition could affect any pipe support installed in a Category I structure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                       |     |  |  |  |  |
|                                 | This deficiency was identified as a result of EN DES investigation into several Black and Veatch findings that concerned the use of the drawing. The Black and Veatch findings reviewed did not result in any hanger installations being identified as nonconforming to drawing 47AO50-lT.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                       |     |  |  |  |  |
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|                                 | HOD OF DISCOVERY Rlack & Vearch Review                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 9 SIGNIFICANT CONDITION ADVERSE TO QUALITY YES \$\( \) NO   \( \)                                                                                                     |     |  |  |  |  |
| <del>-=</del>                   | D CODE (EN DES-EP 8.01) N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 10 BRANCH CHIEF/DATE OC Starte 1-11-8                                                                                                                                 | ·3  |  |  |  |  |
| 11 CORE                         | RECTIVE ACTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                       |     |  |  |  |  |
| for<br>dia<br>The<br>ver<br>exa | Turit 2 that have 1-1/4-inch or larger di<br>meter grouted anchors that could be adver<br>ese supports were identified to CONST (see<br>rify whether the note had been used. If t<br>act weld length and size.<br>ST has completed its inspection (see memo                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | se conditions if the note was applied.  memo WBP 830429 032) requesting them to he note was used, CONST would provide the  WBN 830523 005) of all supports identified |     |  |  |  |  |
| for<br>the                      | EN DES. Of 22 supports for Unit 1 identi<br>anchor bolts was made on five supports.<br>see supports determined the installation i<br>entified to CONST none are installed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Review of the detailed calculations for                                                                                                                               |     |  |  |  |  |
| and                             | DES has also completed the evaluation of found no similar deviation of this note. the typical drawing series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ••                                                                                                                                                                    |     |  |  |  |  |
|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | •                                                                                                                                                                     |     |  |  |  |  |
|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                       |     |  |  |  |  |
| '                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                       |     |  |  |  |  |
|                                 | RECTIVE ACTION DEVIATES FHOM A DESIGN CRITERIA REQUI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                       |     |  |  |  |  |
| -                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Ten -                                                                                                                                                                 | 1 . |  |  |  |  |
| 14) ECN H                       | REQUIRED X VIS NOT 1 CON NO. 3988                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 15 SCHEDULE IMPACT P A                                                                                                                                                | , N |  |  |  |  |

| *100     |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          | MONCONFORMANCE REPORT                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <u> </u> | ASSIGNABLE CAUSE (REQUIRED IF SIGNIFICANT)                                                                                                                                                                                                                                                                                                                                                                                                  |
|          | The designer and checker did not anticipate that any other types of bolt sizes larger than 7/8 inch in diameter would be used in pipe supports. Later, different type of bolts and larger diameter bolts were used but the note was not revised.                                                                                                                                                                                            |
|          |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|          |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|          |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|          |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|          |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| İ        |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| m        | THIS IS A GENERIC CONDITION YES NO T                                                                                                                                                                                                                                                                                                                                                                                                        |
| 100      | ACTION REQUIRED TO PREVENT RECURRENCE IREQUIRED IF SIGNIFICANTI                                                                                                                                                                                                                                                                                                                                                                             |
|          | To alleviate these conditions, EN DES has stopped the use of the note for bolts 1-inch diameter and larger. Drawing 47A050-IT was revised and issued under ECN 3988. Also, a "Construction Specification N3C-928" was issued (February 10, 1983). This specification provides requirements for locating attachments on embedded plates, and will require a detailed review of connections of this nature which could be adverse conditions. |
| 3        | 'INDEPENDENT REVIEW Bisham Cumpill 7/26/83  LABOR EST (X), ACT ( ) 75 DAYS                                                                                                                                                                                                                                                                                                                                                                  |
| 20       | ACTIVITY NO. NCLT4P2 22 TASK DESCRIPTION NCR Collector 24 DATE INITIATED 1-25-83                                                                                                                                                                                                                                                                                                                                                            |
| 1        | REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|          |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|          |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>™</b> | DISTRIBUTION  CONST PROJECT MANAGER  EN DES PROJECT MANAGER                                                                                                                                                                                                                                                                                                                                                                                 |
| کت       | OFFICE OF CA                                                                                                                                                                                                                                                                                                                                                                                                                                |
|          | HEE ITS SANGEN CHIEFORG. DATE                                                                                                                                                                                                                                                                                                                                                                                                               |
|          | ASSISTANT TO THE MANAGER OF DEDC ICLIANTY and Revision Safety for Separtizant ICRs                                                                                                                                                                                                                                                                                                                                                          |
|          | DISTRIBUTE AFTER THIS SIGNATURE HANDCARRY COPY TO RESILS MEDS ACCESSION NO.                                                                                                                                                                                                                                                                                                                                                                 |

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## EN DES NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

## HCR HD. WON/SWP 8278

SIGNIFICANT YES K NO D

YES X NO C

- A. Have any analyses, contracts, memorandums, etc., requiring EM DES work been generated? Yes X No O If yes, list in (C) below.
- B. Have all ECMs related to the MCR been issued?

  M/A D Yes X No D If yes, list in (C) below.
- C. Documents related to the NCR (ECM, analyses, memos, contract No., etc.)

|    | -                                                                                                   |                            | 01V100                     |          |
|----|-----------------------------------------------------------------------------------------------------|----------------------------|----------------------------|----------|
|    | (alosEP)                                                                                            | REF OR MEDS<br>ACCESS. NO. | WORKING<br>(see (F) below) | COMPLETE |
|    | ECN 3988 DATA SHEET # 1                                                                             | WED 800707658              |                            | LEC      |
|    | LICE WANTEND BZ73 SUNCUATION                                                                        | WED \$308 10 037           |                            | 704      |
|    |                                                                                                     |                            |                            |          |
|    |                                                                                                     | -                          |                            |          |
|    |                                                                                                     |                            |                            |          |
|    | · · · · · · · · · · · · · · · · · · ·                                                               |                            |                            |          |
|    |                                                                                                     |                            |                            | <u></u>  |
|    |                                                                                                     |                            |                            |          |
|    |                                                                                                     |                            |                            | -        |
| D. | Is action by organization outside EN<br>Organization tracking No. (NCR, QCIF                        |                            | es Wash                    |          |
| E. | Has all necessary EN DES information outside EN DES to enable the complet Yes No N/A X If yes, list | ion of work requi          | to an organization         | on .     |
| F. | If any document listed in (C) above item 26 on the NCR cannot be signed.                            |                            | he working status          | block,   |
| G. | Is all EN DES action complete? Yes                                                                  | X No □                     |                            |          |
| 12 | Domo who .                                                                                          |                            |                            |          |

Page 1 of 1

Verified by R.M. Prett Date 11/20/03

EN DES-EP 1.26
Attachment No. 1
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NONCONFORMANCE REPORT GENNEB8301 ME AMERICANABLE CAUSE: (REQUIRED IF SIGNIFICANT) EN DES failed to comply to IESE-279 sec. 4.6 and sec. 4.22. The routing of the cables nondivisional resulted from the lack of their identification as being in this protection system. This fails to meet single failure criterion. 17 THIS IS A GENERIC CONDITION ACTION REQUIRED TO PREVENT RECURRENCE: (REQUIRED IF SIGNIFICANT) All logic and control drawings are checked through the Electrical Engineering Support Branch to ensure compliance to accepted IEEE standards. Further review is required per EN DES-EP 4.25. Further review is an evaluation of a drawing beyond the checking activity which is required to ensure the acceptability of a design. This further review procedure was initiated November 3, 1977. "INDEPENDENT REVIEW: 74, PBL 6/14/83 LABOR EST. ( ), ACT. ( ) MH 21 SCHEOULE EST. ( ), ACT. ( ) DAYS ACTIVITY NO. 23 TASK DESCRIPTION DATE INITIATED Referred to MEB for handling (NES 93 0/3/257).
2. Referred to EEB for handling February 18, 1983. LER 27 DISTRIBUTION: 2 ALL EN DES ACTION COMPLETE: CONST PROJECT MANAGER EN DES PROJECT MANAGER CHIEF, 858 OFFICE OF CA 468 Hersburk DATE BETANT TO THE MANAGER OF GEDC IO DISTRIBUTE AFTER THIS SIGNA MANDCARRY COPY TO HEE-HUS MEDS ACCESSION NO.

SWP '83 0110 126

SWP '83 0114 017

S30120E0532 1 REPORT NO. WBNSWP8301 PLANT Watts Bar Nuclear Plant UNIT PREPARERIORGANIZATION/DATE R. L. Ilich/SWP/1-10-83 5 DESCRIPTION OF CONDITION Various supports on the auxiliary feedwater system have not been modified, redesigned, or initially designed per revised analysis under ECN 2576. The above condition represents a situation which, if it had not been detected, may have resulted in the inability of pipe supports to accomplish their safety function. These discrepancies were identified during Black & Veatch review on findings F369, F371, F756, F767 F783, F784, F788, F794, F845, F853, F855, F899, F911, F949, F950, F951, F955, F958, F963, F965. F975, and F986. 6 DATE OF OCCURRENCE EST (X), ACT. ( ) 9/20/82 9 SIGNIFICANT CONDITION ADVERSE TO QUALITY YES X NO 🗌 ٦ METHOD OF DISCOVERY Black & Veatch Review 10 \*BRANCH CHIEF/DATE UNID CODE (EN DES-EP 8.01) N/A 11 CORRECTIVE ACTION CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT DESIGN CRITERIA DOCUMENT NO. EXCEPTION REQUEST NO. 14 ECN REQUIRED 15 SCHEDULE IMPACT ☐ YES 

|     | NONCONFORMANCE RE                                                                                                                                                                                                                                                                                                | EPORT              | 1 REPORT NO.                                                   | Wakshipe 301    |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------------------------------------------|-----------------|
| 116 | ASSIGNABLE CAUSE (REQUIRED IF SIGNIFICANT)                                                                                                                                                                                                                                                                       |                    |                                                                |                 |
|     | THE CAUSE INECOMED IF SIGNIFICANTI                                                                                                                                                                                                                                                                               |                    | ·                                                              |                 |
|     |                                                                                                                                                                                                                                                                                                                  |                    |                                                                |                 |
|     | THIS IS A GENERIC CONDITION YES NO                                                                                                                                                                                                                                                                               |                    |                                                                |                 |
| 18  | ACTION REQUIRED TO PREVENT RECURRENCE: (REQUIRED IF SIGNIFICANT                                                                                                                                                                                                                                                  |                    |                                                                |                 |
| 19  | INDEPENDENT REVIEW:                                                                                                                                                                                                                                                                                              |                    |                                                                |                 |
|     |                                                                                                                                                                                                                                                                                                                  |                    | <del></del>                                                    |                 |
| 20  | THE CONTROLL                                                                                                                                                                                                                                                                                                     | E EST. ( ), ACT. ( |                                                                | DAYS            |
| 25  | ACTIVITY NO. 23 TASK DESCRIPTION REMARKS:                                                                                                                                                                                                                                                                        |                    | 24 DATE INITIA                                                 | TED             |
|     | This NCR is superseded by NCR WBNSWP8301 R1                                                                                                                                                                                                                                                                      |                    |                                                                |                 |
| 28  | DISTRIBUTION  CONST PROJECT MANAGER R. L. Ilich EN DES PROJECT MANAGER CHIEF, ESB OFFICE OF QA NEB (for Significant NCRs)** MEDS CIS NSRS (for Significant NCRs)* ASSISTANT TO THE MANAGER OF OEDC (Quality and Nuclear Safety)for Significant NCRs DISTRIBUTE AFTER THIS SIGNATURE  **HANDCARRY COPY TO NEB-NLS | OC St              | S ACTION COMPLETE  AND HE CHIEF/ORG.  83 011  MEDS ACCESSION N | 1-14-83<br>DATE |

CEB 83 0 3 2 3 0 1 1 830613F0364 T REPORT NO. GENCERATOR All Units 2 PLANT All Plants (BFM, SQM, WBM, BLM) 3 year PREPAREA/ORGANIZATION/DATE D. W. Hargroves/EN DES-CEB/3-17-83 Specific cases have been discovered, using the direction cosines options in the program -AMCHORS, which do not produce hand-verifiable results which correlate with the inputs specified in the users manual. 9 SIGNIFICANT CONDITION ADVERSE TO QUALITY DATE OF OCCURRENCE EST (3 ), ACT. ( ) 1976 7 METHOD OF DISCOVERY 10 BRANCH CHIEF/DATE UNID CODE (EN DES-EP 8.01) 11 CORRECTIVE ACTION 12 CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT 13 DESIGN CRITERIA DOCUMENT NO. **EXCEPTION REQUEST NO.** 

16 SCHEDULE IMPACT

VES.

14 ECN REQUIRED

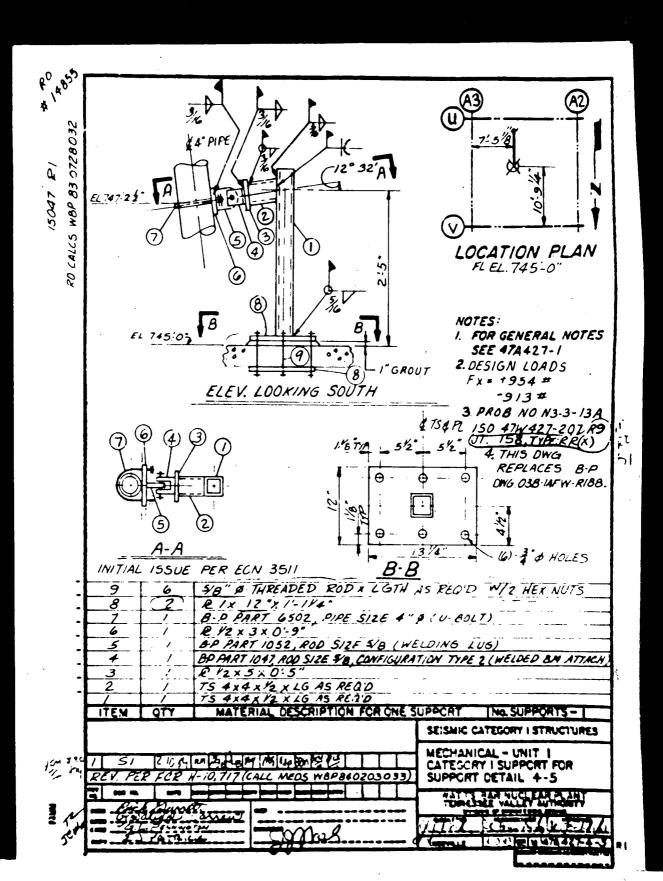
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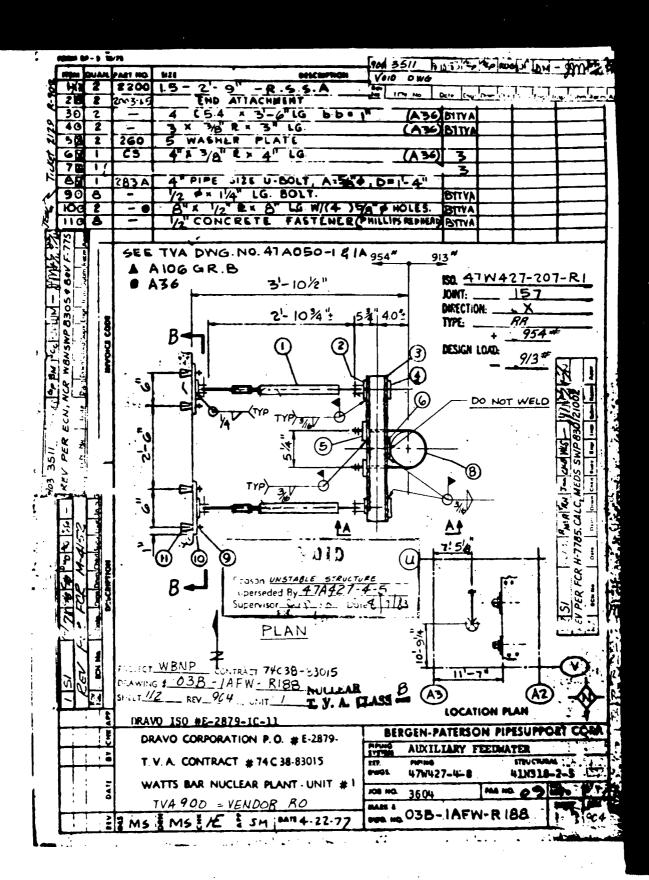
| 23,          |                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                    |
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|              |                                                                                                                                                                                                                                       | NONCONFORMANCE REPORT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                    |
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| 16           | ASSIGNABLE CAUSE: IREQUIRED                                                                                                                                                                                                           | F SIGNIFICANT)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                    |
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|              |                                                                                                                                                                                                                                       | YES NO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                    |
| 10           | ACTION REQUIRED TO PREVENT RE                                                                                                                                                                                                         | CURRENCE: (REQUIRED IF SIGNIFICANT)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                    |
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| 19           | *INDEPENDENT REVIEW:                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ·                                                                                  |
| <b>E</b> 33  | *INDEPENDENT REVIEW:                                                                                                                                                                                                                  | MH [21] SCHEDULE EST ( ),                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ACT.( )                                                                            |
| <b>18 18</b> | LABOR EST. ( ), ACT. ( ) ACTIVITY NO.                                                                                                                                                                                                 | MH 21 SCHEDULE EST. ( ),                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ACT. ( ) DAYS                                                                      |
|              | LABOR EST. ( ), ACT. ( )                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | UN 13                                                                              |
| <b>E E</b>   | LABOR EST. ( ), ACT. ( ) ACTIVITY NO, REMARKS:                                                                                                                                                                                        | 23 TASK DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 24 DATE INITIATED                                                                  |
| <b>E E</b>   | LABOR EST. ( ), ACT. ( ) ACTIVITY NO, REMARKS:                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 24 DATE INITIATED                                                                  |
| <b>E E</b>   | LABOR EST. ( ), ACT. ( ) ACTIVITY NO, REMARKS:                                                                                                                                                                                        | 23 TASK DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 24 DATE INITIATED                                                                  |
| <b>E E</b>   | LABOR EST. ( ), ACT. ( ) ACTIVITY NO, REMARKS:                                                                                                                                                                                        | 23 TASK DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 24 DATE INITIATED                                                                  |
| <b>E E</b>   | LABOR EST. ( ), ACT. ( ) ACTIVITY NO, REMARKS:                                                                                                                                                                                        | 23 TASK DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 24 DATE INITIATED                                                                  |
| <b>E E</b>   | LABOR EST. ( ), ACT. ( ) ACTIVITY NO, REMARKS:                                                                                                                                                                                        | 23 TASK DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 24 DATE INITIATED                                                                  |
|              | LABOR EST. ( ), ACT. ( )  ACTIVITY NO.  REMARKS:  The NCR is superce                                                                                                                                                                  | 23 TASK DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 24 DATE INITIATED                                                                  |
|              | LABOR EST. ( ), ACT. ( )  ACTIVITY NO.  REMARKS:  The NCR is superce                                                                                                                                                                  | TASK DESCRIPTION  ided by GENCEB8302 R1, MEDS Accession                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 24 DATE INITIATED                                                                  |
|              | LABOR EST. ( ), ACT. ( )  ACTIVITY NO.  REMARKS:  The NCR is superce                                                                                                                                                                  | TASK DESCRIPTION  ided by GENCEB8302 R1, MEDS Accession                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | On Number CEB 830608 010.                                                          |
|              | CONST PROJECT MANAGER CHEF, ESS CHEF, ESS CHEF, ESS CHEF, ESS CATOLOGY CONST PROJECT MANAGER CHEF, ESS CFFICE OF QA                                                                                                                   | TASK DESCRIPTION  ided by GENCEB8302 R1, MEDS Accession                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | On Number CEB 830608 010.                                                          |
|              | LABOR EST. ( ), ACT. ( )  ACTIVITY NO.  REMARKS:  The NCR is superce  The NCR is superce  CONST PROJECT MANAGER EN DES PROJECT MANAGER CHIEF, ESB OFFICE OF QA NES (for Significant NCRs)** MEDE CIS                                  | TASK DESCRIPTION  eded by GENCEB8302 R1, MEDS Accession  and ALL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | On Number CEB 830608 010.                                                          |
|              | LABOR EST. ( ), ACT. ( )  ACTIVITY NO.  REMARKS:  The NCR is superce  CONST PROJECT MANAGER EN DES PROJECT MANAGER CHIEF, ESP OF FIG. OF QA MES (for Significant NCRs)**  MERS (for Significant NCRs)*  ASSISTANT TO THE MANAGER OF C | Eded by GENCEB8302 R1, MEDS Accession ALL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | On Number CEB 830608 010.  EN DES ACTION COMPLETE:  SALULY BRANCH CHIEF/ORG.  DATE |
|              | LABOR EST. ( ), ACT. ( )  ACTIVITY NO.  REMARKS:  The NCR is superce  CONST PROJECT MANAGER EN DES PROJECT MANAGER CHIEF, ESB OFFICE OF QA NES (for Significant NCRs)** MEOS CIS NERS (for Significant NCRs)**                        | Eded by GENCEB8302 R1, MEDS Accession ALL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | On Number CEB 830608 010.  EN DES ACTION COMPLETE:                                 |

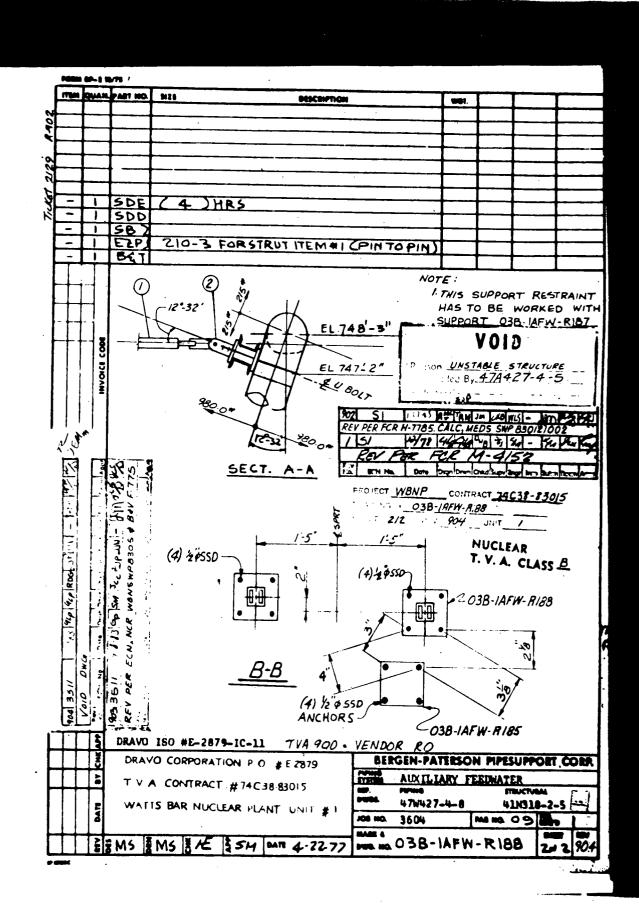
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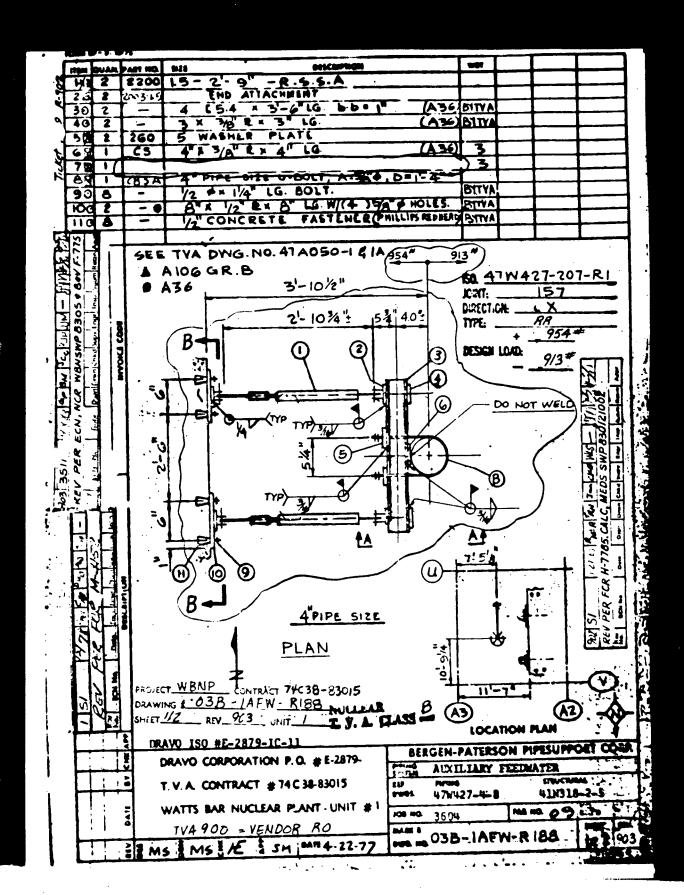
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|----------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------|----------|
|          |           |                                                                                                                                                                                                  |                                             |                            | <u> </u> |
| <u> </u> | PLANT     | WATTS BAR NUCLEAR PLANT                                                                                                                                                                          |                                             | 3 UNIT 1                   |          |
| 4        | PREPARE   | R/ORGANIZATION/DATE R. L. Ilich/SWP/Janua                                                                                                                                                        | ry 10, 1983                                 | •                          |          |
| <b>6</b> | DESCRIPT  | ION OF CONDITION                                                                                                                                                                                 |                                             |                            |          |
|          |           | The design for support 03B-1AFW-R188 tightening of the U-bolt and will the This deficiency was identified during                                                                                 | erefore not                                 | allow for adequate re      | straint. |
|          |           |                                                                                                                                                                                                  |                                             | 840420E02                  | 49 (10)  |
|          |           |                                                                                                                                                                                                  |                                             |                            |          |
|          |           |                                                                                                                                                                                                  |                                             |                            | •        |
| 16       | DATE OF ( | OCCURRENCE EST ( X), ACT. ( ) December 1978                                                                                                                                                      | 9 SIG. IFICA                                | NT CONDITION ADVERSE TO OL | UALITY   |
|          | METHOD (  | OF DISCOVERY Black & Veatch Review                                                                                                                                                               | 1                                           | YES & NO ]                 | ····     |
| 8        |           | E (EN DES-EP 8.01) N/A                                                                                                                                                                           | 10 BRANCH                                   | CHISE DATE SILL            | 1/10/83  |
| _        |           | Support 03B-1AFW-R188 was modified un<br>nonconforming condition. The major<br>feedwater system have been reviewed<br>reanalysis reasons. No other unstal<br>and we consider this to be a unique | ity or the s<br>in the last<br>ble structur | six months by TVA fo       | ary<br>r |
|          |           |                                                                                                                                                                                                  |                                             |                            |          |
|          |           |                                                                                                                                                                                                  |                                             |                            |          |
|          |           |                                                                                                                                                                                                  |                                             | ·                          |          |
|          |           |                                                                                                                                                                                                  |                                             |                            |          |
|          |           |                                                                                                                                                                                                  |                                             |                            |          |
| 155      | CORRECT   | IVE ACTION DEVIATES FROM A DESIGN CRITERIA RECO                                                                                                                                                  | JIREMENT                                    | YES NO K                   |          |
| 12       |           | RITERIA DOCUMENT NO. N/A                                                                                                                                                                         |                                             | EXCEPTION REQUEST NO       | N/A      |
| 냼        | ECN RECH  | 3511                                                                                                                                                                                             |                                             | 15 SCHEDULE IMPACT         | P A N    |
| تتن      | ECH MEU   | NINEO CO CO.                                                                                                                                                                                     |                                             |                            |          |

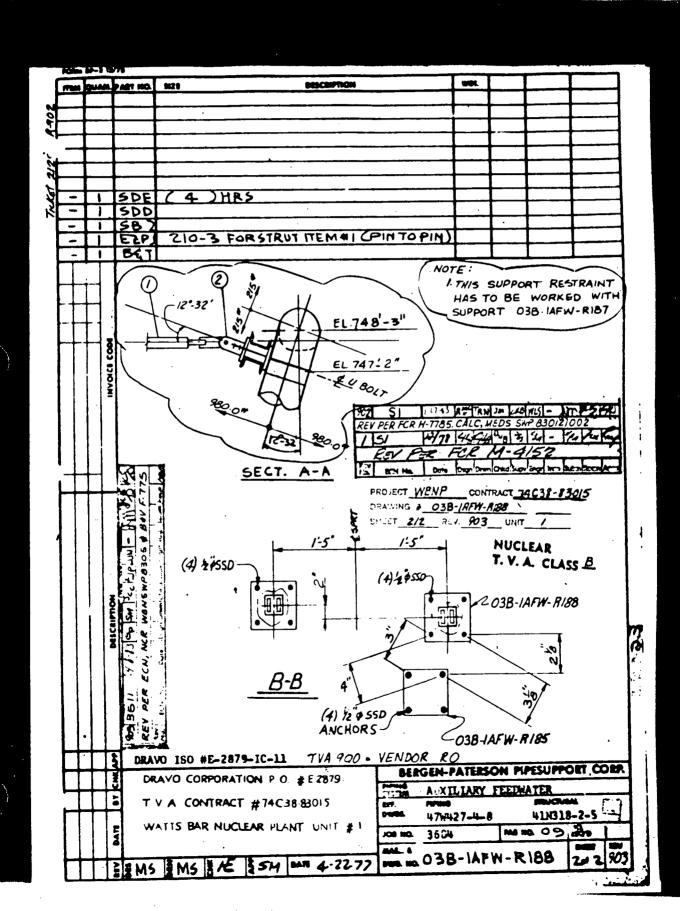
|              | NONCONFORMANCE REPORT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                     |  |  |  |  |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|--|--|--|--|
|              | - HONGON FORMANDE MET                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1 REPORT NO. WBNSWP8305                             |  |  |  |  |
| [i6]         | ASSIGNABLE CAUSE TREQUIRED IF SIGNIFICANT)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                     |  |  |  |  |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | destand in this success                             |  |  |  |  |
|              | The way the U-bolt and support components were resulted in an unstable structure. This conditional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capability of the functional capa | tion was due to inadequate design                   |  |  |  |  |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | · · · · · · · · · · · · · · · · · · ·               |  |  |  |  |
|              | •                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                     |  |  |  |  |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                     |  |  |  |  |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                     |  |  |  |  |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                     |  |  |  |  |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                     |  |  |  |  |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                     |  |  |  |  |
| [i]          | THIS IS A GENERIC CONDITION YES NO X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                     |  |  |  |  |
| 10           | ACTION REQUIRED TO PREVENT RECURRENCE. IREQUIRED IF SIGNIFICANTI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                     |  |  |  |  |
| ت            | This support was designed by Bergen-Patterson                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | and later taken over by TVA.                        |  |  |  |  |
|              | This support was designed by bergen-ratterson<br>The subsequent reviews for reanalysis have sh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | own no recurrence. No                               |  |  |  |  |
|              | further action is required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                     |  |  |  |  |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                     |  |  |  |  |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                     |  |  |  |  |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | '                                                   |  |  |  |  |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ·                                                   |  |  |  |  |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                     |  |  |  |  |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                     |  |  |  |  |
| _            | m & M. M.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 211                                                 |  |  |  |  |
| 19           | INDEPENDENT REVIEW Of S. OV ALUEU 120                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>A</b> #                                          |  |  |  |  |
| 20           | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | EST ( ), ACT. ( ) N/A DAYS    24 DATE INITIATED N/A |  |  |  |  |
| [22]<br>[25] | ACTIVITY NO. N/A 23 TASK DESCRIPTION N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | (a) Sale Million By A                               |  |  |  |  |
| 23           | Additional corrective action by CONST is being                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ne tracked by ECN 3511                              |  |  |  |  |
|              | Additional corrective action by const is bear                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | .,                                                  |  |  |  |  |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ·                                                   |  |  |  |  |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                     |  |  |  |  |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                     |  |  |  |  |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                     |  |  |  |  |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                     |  |  |  |  |
| _            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | C ALL SU DES ACTION COMPLETS                        |  |  |  |  |
| ۳            | DISTRIBUTION: CONST PROJECT MANAGER R. L. Ilich, 375 GB-K                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | R ALL EN DES ACTION COMPLETE                        |  |  |  |  |
| 28           | EN DES PROJECT MANAGER<br>CHIEF, ESB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 6 4 Chandle 4-684                                   |  |  |  |  |
|              | OFFICE OF QA NEB (for Significant NCRs)**                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | *BRANCH CHIEF/ORG. DATE                             |  |  |  |  |
|              | MEDS CIS ************************************                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                     |  |  |  |  |
|              | ASSISTANT TO THE MANAGER OF OEDC (Quality and Nuclear Safety)for Significant NCRs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | MEB '840409 015                                     |  |  |  |  |
|              | DISTRIBUTE AFTER THIS SIGNATURE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                     |  |  |  |  |
|              | ** HANDCARRY COPY TO NEB-NLS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | MEDS ACCESSION NO.                                  |  |  |  |  |

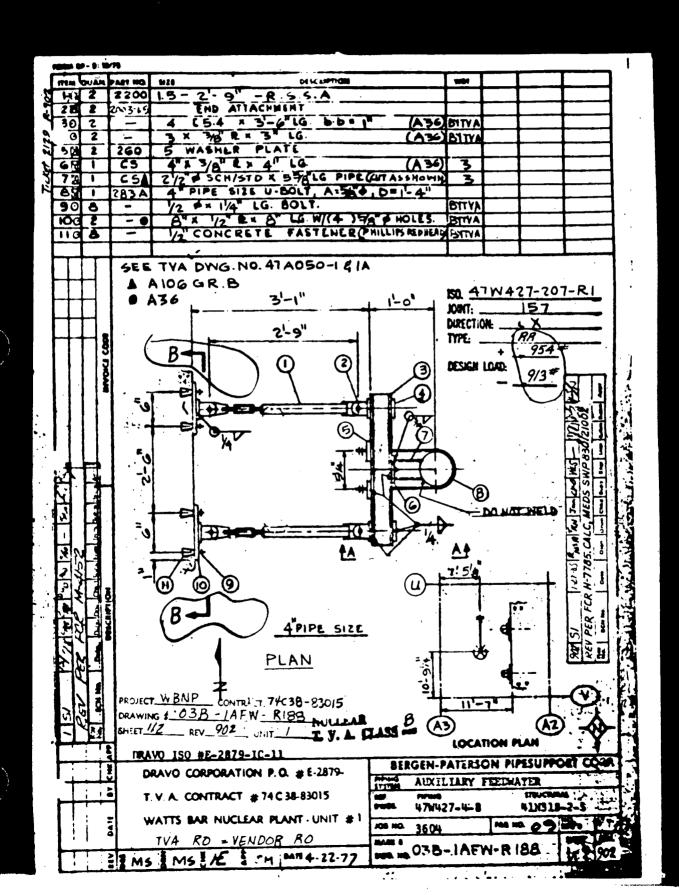


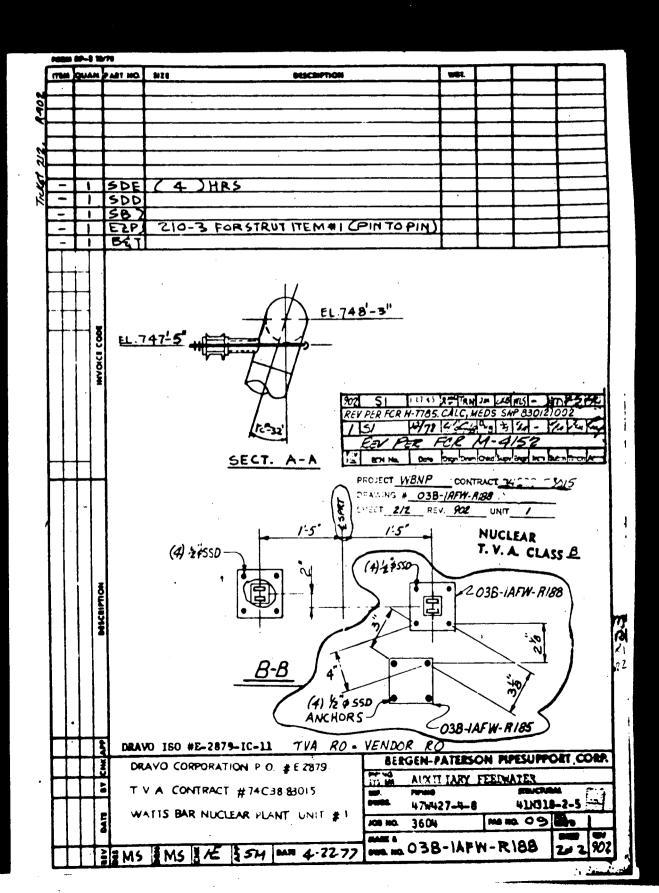












### EN DES NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

NCR NO. WBN JWP8305

SIGNIFICANT YES 🕱 NO D

REPORTABLE YES O

- A. Have any analyses, contracts, memorandums, etc., requiring EN DES work been generated? Yes D No G If yes, list in (C) below.
- B. Have all ECNs related to the NCR been issued? N/A□ Yes M No□ If yes, list in (C) below.
- C. Documents related to the NCR (ECN, analyses, memos, contract No., etc.)

| 1 018 4/21/83<br>1 018 3/21/84 |
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|                                |
| 11526 3/21/84                  |
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|                                |
|                                |

- E. Has all necessary EN DES information been transmitted to an organization outside EN DES to enable the completion of work required?
- F. Is all EN DES action complete? Yes X No □
- G. Remarks:

Verified By Kalu Slik Date 4/2/84

Page \_\_ of \_\_

MEDS Accession No. SWP '83 0125 178

|                                                                                                                                     | , ,                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
|                                                                                                                                     | 1 HEPORT NO. WBNSWT8309                                |
| 2 PLANT WATTS BAR NUCLEAR PLANT                                                                                                     | 3 UNIT 1                                               |
|                                                                                                                                     | /January 25, 1983                                      |
| 5 DESCRIPTION OF CONDITION                                                                                                          |                                                        |
| Box anchors 47A060-3-8 and 47A060-3-10 fail force in the z-direction as required by Des Revision 1 of 47A060-3-8 allows 25.8 percen | side. Section 7.1.4 of the design criteria 10 percent. |
| •                                                                                                                                   | 840420E0248 (3)                                        |
|                                                                                                                                     |                                                        |
|                                                                                                                                     |                                                        |
| DATE OF OCCURRENCE EST (X), ACT ( ) 12/8/80                                                                                         | 9 SIGNIFICANT CONDITION ADVERSE TO QUALITY             |
| METHOD OF DISCOVERY Findings F-319 & F-324                                                                                          | 11. 12 NO. 12                                          |
| UNID CODE IF N DES EP 8 011 47                                                                                                      | 10 BHANCH CHIEF DATE C Stardy 1.25-83                  |
| stiffness requirements of design criteria W                                                                                         | -DO-40-31:13, SECCION /:1.4.                           |
|                                                                                                                                     |                                                        |

|          | NONCONFORMANCE DEB                                                                                                                                                                                                                                                                                                           | NORT .                                        |                                                 |            |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------------------------------------------------|------------|
|          | NONCONFORMANCE REP                                                                                                                                                                                                                                                                                                           |                                               | I REPORT NO                                     | WBNSWP8309 |
| [66]     | ASSIGNABLE CAUSE - IREQUIRED IF SIGNIFICANTI                                                                                                                                                                                                                                                                                 |                                               |                                                 |            |
|          | The stiffness of anchors 47A060-3-8 and 47A060-3-10 of design criteria WB-DC-40-31.15 is due to inadequate                                                                                                                                                                                                                   | failing to m<br>ate design an                 | eet the requi<br>d checking.                    | rements    |
|          |                                                                                                                                                                                                                                                                                                                              |                                               |                                                 |            |
|          |                                                                                                                                                                                                                                                                                                                              |                                               |                                                 |            |
|          |                                                                                                                                                                                                                                                                                                                              |                                               |                                                 |            |
| 同        | THIS IS A GENERIC CONDITION YES NO 🔀                                                                                                                                                                                                                                                                                         |                                               |                                                 |            |
|          | ACTION REQUIRED TO PREVENT RECURRENCE - REQUIRED IF SIGNIFICANTI                                                                                                                                                                                                                                                             |                                               |                                                 |            |
|          | All support designers involved in box anchor design (WBP 840213 021) of the latest stiffness requiremen input memorandum on piping system anchor criteria W Designers have also been trained in the application Interface Coordination of Detailed Construction and                                                          | ts as specifi<br>B-DC-40-31.15<br>of EP 4.25, | ied by design<br>5 (CEB 830603<br>Design Reviev | 028).      |
|          | 60 21 M. h. 111                                                                                                                                                                                                                                                                                                              |                                               |                                                 | Cost       |
| 19<br>20 | LABOREST (), ACT () N/A MH [21] SCHEDULE                                                                                                                                                                                                                                                                                     | EST C 1, ACT C 1                              | N/A                                             | DAYS       |
| 22       | ACTIVITY NO. N/A 23 TASK DESCRIPTION N/A                                                                                                                                                                                                                                                                                     |                                               | 24 DATE INITIA                                  |            |
| 75       | Additional corrective action by CONST is being trace.                                                                                                                                                                                                                                                                        | ked by ECN 35                                 | 511.                                            |            |
| 27       | DISTRIBUTION CONST PROJECT MANAGER R. L. Ilich, 375 GB-K EN DES PROJECT MANAGER CHIEF, ESB OFFICE OF QA NEB (for Significant NCRs)** MEDS CIS **NSRS (for Significant NCRs)* ASSISTANT TO THE MANAGER OF DEDC (Quality and Nuclear Safety)for Significant NCRs **DISTRIBUTE AFTER THIS SIGNATURE **HANDCARRY COPY TO NEB-NLS | *BRANCH                                       | ACTION COMPLETE  CHIEF/ORG.  MEDS ACCESSION N   |            |

## EN DES NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

## NCR NO. WBN5WP8309

SIGNIFICANT YES NO D

REPORTABLE YES D NO D

- A. Have any analyses, contracts, memorandums, etc., requiring EN DES work been generated? Yes # No O If yes, list in (C) below.
- B. Have all ECNs related to the NCR been issued? N/A □ Yes Q No □ If yes, list in (C) below.
- C. Documents related to the NCR (ECN, analyses, memos, contract No., etc.)

| -                                                                  | REF OR MEDS<br>ACCESS. NO. | COMPLETION DATE |
|--------------------------------------------------------------------|----------------------------|-----------------|
| ANCHOR DRAWNG                                                      | 47A060-3-8 R2              | 8/10/23         |
| 474060-3-8 ANCHER CALCS                                            | WBP840123 050              | 1/23/54         |
| ANCHOR UMWING                                                      | 47A060-3-10 R3             | 8/10/43         |
| 47A060-3-10 Another Cares                                          | WBP840123017               | ١٤٤١            |
| REQUIREMENTS NOTIFICATION MANY                                     | WBP840213021               | 2/13/84         |
| ECN 3611 CLOSURE SHEET                                             | W6PF40321526               | 3/21/84         |
|                                                                    |                            |                 |
|                                                                    |                            | ·               |
| Is action by organization outside Organization tracking No. ECN 35 |                            | s SP No D       |

- E. Has all necessary EN DES information been transmitted to an organization outside EN DES to enable the completion of work required?

  Yes R. No D. N/A D. If yes, list in (C) above.
- F. Is all EN DES action complete? Yes No □
- G. Remarks:

Verified By Roba D. Mil Date 4/2/84

Page \_\_ of \_\_

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MEDS Accession No. SWP 83 0209 047

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## EN DES NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

### NCR NO. WENSWP1312

SIGNIFICANT YES D NO MA

REPORTABLE YES O NO X

- A. Have any analyses, contracts, memorandums, etc., requiring EN DES work been generated? Yes D No X If yes, list in (C) below.
- B. Have all ECNs related to the NCR been issued?

  N/A K Yes D No D If yes, list in (C) below.
- C. Documents related to the NCR (ECN, analyses, memos, contract No., etc.)

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TVA 10700A (EN DES--12/83)

DIVISION OF ENGINEERING DESIGN NONCONFORMANCE REPORT

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MEDS ACCESSION NO.

## ATTACHMENT 3B PART 1

ADDITIONAL ATTACHMENTS REFERENCED IN
THE RESPONSE TO QUESTION 4
ON THE BLACK AND VEATCH INDEPENDENT
DESIGN VERIFICATION PROGRAM AS FORWARDED
IN THE MAY 30, 1985, LETTER FROM
T. M. NOVAK TO H. G. PARRIS

TVA 64 (02-9-65)

UNITED STATES GOVERNMENT

# Memorandum

TENNESSEE VALLEY AUTHORITY
EDC '840320 402

TO

E. Gray Beasley, OEDC Program Manager, Black and Veatch Review, W12B21 C-K

FROM

Henry L. Jones, Chairman, Task Force for Review of Black and Veatch

DATE

Findings, WIOA17 CK March 20, 1984

840330F0502

SUBJECT:

WATTS BAR NUCLEAR PLANT - UNITS 1 AND 2 - TASK FORCE REPORT

Attached is the final task force report for Watts Bar units 1 and 2.

Henry Jones

HLJ:WBW Attachment

g P

3/20/84 - EGB:WBW cc (Attachment):

J. W. Anderson, M155G MIB-K

C. Bonine, E7B24 C-K

R. W. Cantrell, W11A9 C-K

H. N. Culver, 249A HBB-K

D. R. Patterson, W12A7 C-K

R. M. Pierce, 104 ESTA-K

MEDS, W5B63 C-K

DES '84 0321 014

3/21/84 - JL

cc (Original attachments):

J. C. Standifer, 204 GB-K

xc: MEDS, W5B63 C-K



WATTS BAR NUCLEAR PLANT
UNITS 1 AND 2

TASK FORCE REPORT

EVALUATION OF BLACK AND VEATCH FINDINGS

March 19, 1984

Prepared by:

H. S. Jones, Chairman

E. H., Cole

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D. R. Denton

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A. McDonald

R. C. McKay

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#### BLACK AND VEATCH

# TASK PORCE REPORT

# EVALUATION OF BLACK AND VEATCH FINDINGS

- I. EXECUTIVE SUMMARY
- II. TASK FORCE FORMATION AND RESPONSIBILITIES
- III. EVALUATION OBJECTIVES AND METHODOLOGY
  - A. Objectives
  - B. Evaluation Process
- IV. EVALUATION IMPLEMENTATION
  - A. General
  - B. Results
- V. SAFETY IMPLICATIONS
  - A. General
  - B. Results
- VI. SUMMARY
- VII. REFERENCES
- Table 1: Task Force Categorization of B&V Findings
- Table 2: Final Categories and Associated B&V Findings
- FIGURE 1: Flowchart of Evaluation Steps
- APPENDIX A: Task Force Members
- APPENDIX B: Guidelines for Completing Evaluations and Sample Form
- APPENDIX C: Completed Evaluation Sheets
- APPENDIX D: Failure and Safety Evaluations
- APPENDIX E: Glossary of Terms

# TASK FORCE REPORT EVALUATION OF BLACK AND VEATCH FINDINGS

### I. EXECUTIVE MOMARY

A task force composed of senior OEDC and OQA engineers, working under the general direction of the Independent Review Policy Committee, was formed to establish and administer an evaluation process for the 428 Black and Veatch (BAV) findings with respect to the design and construction of the Watts Bar unit 1 auxiliary feedwater system. One objective of this evaluation was the identification of appropriate corrective action plans for the deviations from licensing commitments identified by Black and Veatch and their generic examples in all Watts Bar systems. Another objective of this evaluation was a determination of the nuclear safety significance of the deviations had they gone undetected and uncorrected. Of the 428 findings, the task force determined that 280 findings did not represent deviations from the licensing commitments and were placed in a category which did not require further evaluation. The remaining 148 findings were sorted into 25 categories consisting of either individual or groups of similar findings. The task force administered this evaluation process and concurred with all corrective action plans for all categories which it deemed to represent a deviation from licensing commitments and determined the nuclear safety significance of the deviations. (Refer to Appendix E, Glossary of Terms, for definitions of the terms "licensing commitments" and "licensing bases" as used in this report.)

Upon completion of the evaluation process, the task force was able to draw conclusions with respect to the deviations from licensing commitments identified by Black and Veatch and their generic examples in the completed work of other Watts Bar systems. The conclusions were:

- o Effective implementation of approved corrective action plan: will bring these deviations in completed work up to a baseline of acceptability with respect to the licensing bases,
- o Effective implementation of approved corrective action plans will improve the achievement and maintenance of a baseline of acceptability in the future performance of similar work,
- o These deviations would not have prevented the performance of any nuclear safety function which is part of the licensing bases.

# II. TASK FORCE FORMATION AND RESPONSIBILITIES

In September 1982, TVA committed to perform an independent review of a selected Watts Bar (WBN) unit 1 system. This review was to verify that TVA had properly developed an adequate design/construction from the bases and criteria specified in its licensing application to meet the functional licensing requirements of the system. This independent review was conducted on the unit 1 auxiliary feedwater (AFW) system by Black and Veatch (B&V). As part of TVA's overall approach to support the Watts Bar independent review, a policy committee was established with top managers from the Office of Engineering Design and Construction (OEDC), the Office of Quality Assurance (OQA), and the Nuclear Safety Review Staff (NSRS).

Black and Veatch's review of the auxiliary feedwater system resulted in the identification of 428 findings. B&V's report identifying these findings was issued to TVA and NRC on April 12, 1983. Prior to the formal issuance of this report, the policy committee determined that it was appropriate to move forward with an evaluation of the B&V findings to determine their applicability to other WBN systems other than the auxiliary feedwater system. To accomplish this evaluation, a task force of senior OEDC and OQA personnel was established by the policy committee on February 18, 1983 (reference 1). The task force members are identified in Appendix A.

The task force was specifically assigned responsibilities by the policy committee which included performance of the following functions:

- o Recommend an overall methodology for evaluating the B&V findings
- o Select and assign OEDC line organizations to perform the final evaluation
- o Establish and maintain surveillance over implementation of the evaluation
- o Goordinate the utilization of B&V information generic to other TVA nuclear units
- o Document and ensure retention of records generated by the evaluation.

With these defined responsibilities, the task force began functioning on February 22, 1983.

# III. EVALUATION OBJECTIVES AND METHODOLOGY

### A. Objectives

The initial efforts of the task force were directed towards the development of a methodology to manage the utilization of the independent design review results for the maximum benefit to TVA. The objectives of the task force's methodology were to identify appropriate corrective actions to:

- o bring past work generically up to a baseline of acceptability, and
- o improve the achievement and maintenance of a baseline of acceptability in future work

To satisfy these objectives the task force defined the seven step action plan below:

- Task force reviews, categorizes, and preliminarily assesses the findings to streamline the evaluation process and identifies the responsible line organization to handle each category.
- Task force initiates final evaluation of each category by the responsible organization.
- Task force issues an initial phase report to provide a detailed description of the categories and the evaluation methodology.
- 4) Task force reviews the issued B&V report and makes any appropriate modifications to the evaluation process.

- Responsible organizations complete final evaluations and identify appropriate corrective actions.
- 6) Task force reviews and concurs in the adequacy of the evaluations and in the definition of corrective actions for each category.
- 7) Task force submits progress reports to the policy committee on the implementation of the evaluation process.
- B. Evaluation Process

To implement this action plan, the task force developed the evaluation process illustrated in Figure 1 (flowchart of evaluation steps). This method was approved and revised by the Policy Committee in references 2, 3, 4 and

- 5. This method required:
- 1. Review and Categorization of the Findings by the Task Force (Steps 1 and 2) In the course of the task force's evaluation of the findings, category 1 was designated as the group of findings that did not require detailed evaluation by the line organizations but might require additional input to close out the B&V finding. Specifically, category 1 included:
  - 1(1) TVA and B&V considered there to be no deviation.

1(2) - B&V identified deviation from final design or construction requirements for which TVA determined the work to be incomplete.

To be considered incomplete, the CONST accountability system and/ or OEDC deviation control system must have identified the remaining work prior to B&V identification.

Note: Some finding warranted categorization for further review because the status of the pertinent corrective action plans in existence at the time of the independent design review would not clearly have maintained a baseline of acceptability for future work once completed work was brought up to a baseline of acceptability. However, since there was reasonable assurance that the plans could have brought completed work up to a baseline of acceptability, these were not considered to be examples of completed construction which did not satisfy the licensing requirements.

- 1(3) B&V findings which required further review to determine if
  a deviation existed since OEDC disagreed with the B&V conclusion.

  Upon completion of the review, all of these findings were
  assigned to another category.
- 1(4) B&V findings which were identified as "Confirmed" or "Open" in B&V

  April 1983 report, for which the TVA position was that the licensing tasis was satisfied. The justification for the TVA acceptance
  of the conditions described in the B&V findings was formally
  documented.

The findings that were not classified as category 1 were grouped to the extent practical and assigned unique category numbers and placed on evaluation sheets (Appendix C) for further detailed review. The classification of findings resulted in the assignment of 25 categories.

Each of the 25 categories was reviewed in detail by a task force member. This review included examination of both OEDC's and Black and Veatch's responses to the findings and discussions by individual task force members with TVA engineers and managers. The task force used the information compiled by the task force member to complete its preliminary appraisal on the evaluation sheets. This preliminary assessment provided an initial direction for the evaluation and corrections necessary for the development of the final TVA position on the category.

After completion of this preliminary evaluation, the task force designated a responsible line organization to develop from an objective basis a proposed final TVA position for each step of the evaluation.

The evaluation performed by the task force members and the line organization involved the following areas.

2. Evaluation for Cause (Step 3) - The objective of this review was to develop a basis for a plan to identify, with reasonable assurance, all similar examples of the deviation elsewhere in TVA nuclear facilities beyond the scope of the Black & Veatch review. This objective could be satisfied by evaluation of groups of findings to determine the most direct control system breakdown (cause) that resulted in the deviations in engineering activity results.

Working upward in the procedural control system, this would typically be the highest level procedural control which was inadequate (lower tier vs. upper tier). Working upward in the performance system this would typically be the highest level where performance or requirement for performance was inadequate (engineer, section, branch, or division level).

Typical examples of direct causes:

- o The division level design control procedures did not require calculations to support all aspects of design.
- o The section supervisors did not enforce the requirement for drawing compatibility.
- o The engineer and checker did not follow the design change procedure.
- 3. Evaluation for Generic Examples (Step 4) Based upon the cause(s) identified in step 3, this review sought to predict the potential scope of occurrence of deviations similar to those in the category. This was

achieved by (1) a review of all work products within that scope to identify the generic examples or (2) selection of a reasonable sample of related activities just outside the potential scope predicted in the preliminary assessment. If no further deviations were identified during evaluation of the sample, the scope of the deviations was considered to have been confirmed. The existence of similar deviations indicated that the cause(s) identified in step 3 needed to be broadened and the "Evaluation for Generic Cause" (step 4) reiterated to evaluate the new predicted scope.

· 在一个时间,我们就是一个时间,我们就是一个时间,我们就是一个时间,我们就是一个时间,我们就是一个时间,我们就是一个时间,我们就是一个时间,我们就是一个时间, 我们就是一个时间,我们就是一个时间,我们就是一个时间,我们就是一个时间,我们就是一个时间,我们就是一个时间,我们就是一个时间,我们就是一个时间,我们就是一个时间 4. Evaluation for Licensing Basis Satisfaction (Step 5) - If a deviation represented a failure to satisfy the licensing commitments, TVA policy and regulations required the deviation and its generic examples to be corrected and efforts made to avoid the occurrence of similar deviations prior to the conduct of licensed activities. Therefore, the "A" side of the evaluation process (6A through 12A) was performed and completed consistent with the schedule for the conduct of licensed activities.

However, there was another situation for which TVA had greater flexibility in determining the degree of corrective actions applied and the schedule for implementation. The "B" side of the evaluation process was used for the non-safety related portion of a nuclear unit. The design/construction of this portion did not have relatively clear regulatory requirements on quality. However, much of this requirement significantly

affected TVA's objectives for nuclear safety, personnel safety, plant operability or plant reliability. For the generic examples of deviation identified in step 4 of the evaluation process which were not safety-related, TVA could choose to apply corrections on a schedule commensurate with the importance of the deviation to these TVA objectives.

This notification to the task force of this evaluation did not replace required actions under the normal evaluation and licensing notification procedures.

- 5. Identification of Ongoing or Necessary Corrective Action for Completed and Future Work (Steps 6, 7, 9, 10) The objective of this evaluation step was to select the most cost-effective solution which would bring completed work up to a baseline of acceptability and/or achieve and maintain a baseline of acceptability for future work. Selected corrective action was to be implemented through the existing OEDC management control systems.
- 6. Follow-up on Implementation of Corrective Action for Completed Work and
  Future Work (Steps 8, 11, and 12) The task force reviewed the proposed
  corrective actions for past and future work and concurred with the line
  organization on an acceptable corrective action program identified in
  steps 8 and 11. The independent verification of the corrective action
  for past work is provided by the checking, review and inspection built

into the line organizations responsibility and covered by its management control system. The implementation of corrective action for future work is the responsibility of the line organization and will be performed under that management control system. The adequacy of the corrective action for future work will be verified by OQA as a part of the OQA surveillance and audit program. Any problem found by OQA will be handled by surveillance reports and audit findings. The completed evaluation forms presented in Appendix C reflect this approach. This approach was needed to help support the maintenance of a baseline of acceptability in future work.

When the corrective action for past and future work was in a controlled program that required tracking and closures, the task force closed the evaluation step. Therefore, the task force did not verify that the correction action for past and future work identified by the evaluation of the 25 categories has been implemented completely or correctly. These responsibilities rested with the performing organizations and OQA.

#### IV. EVALUATION IMPLEMENTATION

#### A. General

To initiate the evaluation process, the task force evaluated all 428 Black and Veatch findings to determine whether a deviation existed with respect to either TVA's licensing or internal commitments for design, construction or operation. Operational preparedness was not specifically reviewed by B&V, but indications of deviations with respect to these licensing commitments were necessarily a part of this evaluation.

This evaluation was an iterative process which placed all 428 Black and Veatch findings into their final task force categories. See Table 1 for a cross reference of all findings and their categories. The summary of this sorting is as follows:

- Category 1 280 Black and Veatch findings which did not require further review for the purpose of identifying corrective actions were placed in this category. The nature of subcategories 1(1), 1(2) and 1(4) was defined in Section III.A.1.
- Categories 3 through 39 148 Black and Veatch findings which required further review for the purpose of identifying appropriate corrective actions were placed in 25 categories. A brief description of these categories and the associated findings are provided in Table 2.

The line organizations's evaluation of each of these 25 categories was documented on the evaluation forms and returned to the task force. The task force reviewed this information and concurred with the line organization's proposed final TVA position for each step of the evaluation. If the task

force did not concur with the line organization, these catagories were further reviewed by the task force chairman, policy committee chairman, and the line organization until concurrence was achieved.

#### B. Results

The results of the detailed evaluation of the 25 categories were corrective action plans tailored to the nature of the deviation(s) identified by Black and Veatch and their generic examples. For the purposes of this discussion, categories 4, 6 and 30 were split into 4(1), 4(2), 6(1), 6(2), 30(1), and 30(2), resulting in 28 categories. A summary of the type corrective action planned for each category:

- Categories of findings for which TVA has justified a conclusion that no deviation with respect to the licensing commitments existed. The evaluation of these categories resulted in no corrective action required for past or future work. (Categories 31, 32, 33, 34, 36, 38.)
- Categories of findings representing deviations from the licensing commitments which were previously identified by TVA and scheduled corrective action could have been reasonably expected to bring past work up to meet the licensing bases. The evaluation of some categories in this group did result in some modifications to the existing planned corrective action for future work to maintain a baseline of acceptability. (Categories 6(1), 7, 9, 12, 19.)

- Categories of findings representing deviations from licensing commitments which did satisfy licensing bases. Evaluation of these categories resulted in corrective action for future work and, if applicable, corrective action for past management controls. (Categories 3, 4(1), 5, 6(2), 13, 18, 20, 25, 30(1), and 39).
- Categories of findings representing deviations from the licensing commitments which also were deviations from the licensing basis.

  Evaluation of these categories resulted in corrective action for past work and corrective action for future work. (Gategories 4(2), 11, 14, 23, 30(2), 35 and 37.)

The completed evaluation forms documenting these evaluations and indicating task force concurrence in the corrective action plans are contained in Appendix C to this report.

Based on these evaluations the task force concluded the following with respect to the deviations from licensing commitments identified by Black and Veatch and their generic examples in the completed work of other Watts Bar systems:

o Effective implementation of approved corrective action plans will bring these deviations in completed work up to a baseline of acceptability with respect to the licensing bases, o Effective implementation of approved corrective action plans will improve the achievement and maintenance of a baseline of acceptability in the future performance of similar work.

# V. SAFETY IMPLICATIONS

#### A. General

Mear the completion of the evaluation of task force categories for corrective action, the task force responsibilities were modified. By reference 6, the task force was assigned to evaluate the nuclear safety implications had the condition identified by Black and Veatch and their generic examples not been detected and corrected. It should be noted that determination of licenseability of any portion of the as-found or as-left facility remained outside the scope of the task force effort.

It was first presumed that the subset of problems for which a nuclear safety determination was required was those Black and Veatch findings and their generic examples which represented undetected deviations from the licensing bases at the time of the independent review. The identification of these deviations used the same screening process and grouping described in Section IV. This screening identified 7 categories of findings which represented undetected deviations from the licensing bases (categories 4(2), 11, 14, 23, 30(2), 35, and 37). For the generic deviations within these categories, the task force requested the performance of failure and/or safety evaluations. The implications to nuclear safety were considered to have been acceptable if either:

- o a failure evaluation concluded that the adverse effect of the deviation would not have resulted in any equipment failure under any design conditions which are part of the licensing bases, or
- o a safety evaluation concluded that the failure of equipment affected by the deviation would not have prevented the performance of any nuclear safety function which is a part of the licensing bases.

#### B. Results

A summary of the failure evaluations and safety evaluations of the deviations from the licensing bases within categories 4(2), 11, 14, 23, 30(2), 35, and 37 is provided in Appendix D.

The task force reviewed these evaluations and concluded the following with respect to the deviations from licensing commitments identified by Black and Veatch and their generic examples in the completed work of other Watts Bar systems:

o These deviations would not have prevented the performance of any nuclear safety function which is part of the licensing bases.

#### VI. SUMMARY

The objective of the task force effort was to evaluate the independent design review results in order to identify: appropriate corrective action plans, and the nuclear safety significance had these deviations not been corrected. Areas outside the scope of task force effort and this report included:
the adequacy of results and findings achieved through implementation of
corrective action plans and, the licensability of any portion of the Watts
Bar facility.

Upon completion of the evaluation process, the task force was able to draw conclusions with respect to the deviations from licensing commitments identified by Black and Veatch and their generic examples in the completed work of other Watts Bar system. The conclusions were:

- o Effective implementation of approved corrective action plans will bring these deviations in completed work up to a baseline of acceptability with respect to the licensing bases,
- o Effective implementation of approved corrective action plans will improve the achievement and maintenance of a baseline of acceptability in the future performance of similar work,
- o These deviations would not have prevented the performance of any nuclear safety function which is a part of the licensing bases.

#### VII. REFERENCES

 E. Gray Beasley's memorandum to the OEDC MO Files dated Harch 1, 1983 (EDC 830301 401).

- 2. E. Gray Beasley's memorandum to the OEDC MD Files dated Harch 4, 1983
  . (EDC 830304 401).
- 3. E. Gray Beasley's memorandum to H. L. Jones dated August 15, 1983 (EDC 830815 403).
- 4. E. Gray Beasley's memorandum to H. L. Jones dated September 23, 1983 (EDC 830923 401).
- 5. E. Gray Beasley's memorandum to H. L. Jones dated October 11, 1983 (EDC 831011 401).
- 6. E. Gray Beasley's memorandum to H. L. Jones dated February 15, 1984 (EDC 840215 401).

TABLE I
TASK PONCE CATEGORISATION OF BLACK & VEATOR
FINDINGS

|             | * ************************************                                                                                                                                                    | Îm.        | <u>Dree</u> | <u> Caronari</u> |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------|------------------|
| 7100        | Failure to manitor operability of ND AFW pump lube oil pump - will manitor, BOH                                                                                                           |            | • PL        | 20               |
| <b>7101</b> | Errors on control diagram - 479600 Series correct, MCR                                                                                                                                    | 1          | R PL        | 3                |
| 7102        | Errors on control diagram - vendor drawing correct, MCR                                                                                                                                   | R          | R PL        | 3                |
| F103        | Errors en logic diagram - instrument tab/schematic drawings serrect, MCR                                                                                                                  |            | R PL        | •                |
| <b>F104</b> | Hest interchange two S/G Lis - drawing error, MCR                                                                                                                                         | <b>B</b> , | • PL        | •                |
| <b>F105</b> | Error on schematic (switch configuration) - febrication drawings correct, MCR                                                                                                             |            | 2 PL        | 3                |
| 7106        | Error on logic diagram (blackout/SI pump start) - schematic drawing correct, MCR                                                                                                          |            | o PL        | 3                |
| <b>7107</b> | Errors on 470600 Series drawings - vender drawings correct, NCR                                                                                                                           |            | R PL        | 3                |
| 7100        | Had indicating light for valve thermal overload bypase does not verify operation of relays &1 through E5 -<br>designed scheme reviewed by HRC and approved in SER                         | c          | 1           | 26               |
| 7109        | Designation of relay coils on drawings - no discrepancy                                                                                                                                   |            |             | 1 (1)            |
| 7110        | Errors on seamostion drawing - schematic drawing serrost, MCR                                                                                                                             |            | R PL        | 3                |
| P111        | Errors on connection drawing - schematic drawing correct, MCR                                                                                                                             | R          | • <b>R</b>  | 3                |
| 7112        | Under certain conditions and failure of Westinghouse W-2 control switch, indicating lights will light dimly -<br>still detect malfunction, will test to confirm acceptability             | ç          | R           | 37               |
| 7113        | Time delay relay setting on schematic drawing do not agree with legic drawing - failure to have written program BCR                                                                       | , R        | 1 PL        | 20               |
| F114        | Errore on schematic drawing - instrument tab correct, MCR                                                                                                                                 | 1          | R PL        | 3                |
| F115        | Designation of monfunctioning relay coil - drawing revision required, MCR                                                                                                                 |            | R PL        | 3                |
| <b>7116</b> | Errors on connection drawing - schematic drawing correct, MCR                                                                                                                             |            | t PL        | 3                |
| <b>7117</b> | Error on external occasetion drawing - schematic diagram correct, MCR                                                                                                                     | R          | 1 PL        | 3                |
| 7118        | Failure to manitor for failure of Wastinghouse W-2 switches, IE Bulletin 80-20 - following identification of mood for trained circuit, will medify to meet requirements of Bulletin 80-20 | •          | •           | •                |
| 7119        | FRAR errors concerning conformance to RG 1.106 - FRAR revisions required                                                                                                                  | <b>,</b> • | 1 PL        | 31               |

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|             |                                                                                                                                                                          | Le el 2<br>True | level 3 | Satesaux. |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------|-----------|
| 7120        | Valve memoralature drawing errors, "MPFF" should be "ERCH" - previously identified by NNC PR                                                                             | c               | 1 PL    | 1 (1)     |
| 7121        | Thermal overload bypasses use safety injection signal, not accident eignal (80 1.106) - mood MBC concurrence                                                             | c               | •       | •         |
| F122        | Testing ochone does not verify operation of all relays used to bypass valve thermal overload - design reviewed and approved by MRG, meets RG 1.106 and IEEE STD 279-1971 | c               | •       | <b>39</b> |
| F123        | Lock of drawing reference on drawing - reference to facilitate search                                                                                                    |                 | R PL    | 3         |
| F124        | Wrong reference drawing on drawing - reference to facilitate search                                                                                                      |                 | R PL    | 3         |
| 7125        | Time delay relay setting on schonatic drawing do not agree with logic drawing - failure to have written program<br>MCR                                                   |                 | 8 PL    | 20        |
| 7126        | Failure to specify time delay relay setting - failure to have written program, MCR                                                                                       | •               | 2 74    | 20        |
| P127        | Errors on schematic drawing - connection/vendor drawings correct, MCR                                                                                                    |                 | 8 PL    | 3         |
| 7128        | Do not bypass "open" torque switch on "trip and throttle valve" per IE Circular 81-13 - will medify, NCE                                                                 |                 | 0 PL    | 23        |
| F129        | Schematic diagram does not agree with logic diagram for "trip and threttle valve" - review echanatic                                                                     |                 | •       | 3         |
| F130        | Errors on logic diagrams - instrument tab/schematic drawings correct, MCR                                                                                                |                 | R 7L    | 3         |
| <b>7131</b> | Errors on electrical schematic - instrument tab correct, MCR                                                                                                             |                 | 1 PL    | 3         |
| F132        | Time delay relay setting on echonatic drawing do not agree with logic diagram - failure to have written program                                                          | . 4             | 1 PL    | 20        |
| 7133        | Failure to have indication when valve FCF-1-51 thermal overloads are bypassed, failure to varify by tasting - NCR                                                        |                 | • 12.   | 23        |
| F134        | Lock of test data for flame test of cable - cable passed flame test                                                                                                      | •               |         | 1 (1)     |
| F135        | Questions concerning cable tray fill criteria by computer - CEDC attempted to justify criteria                                                                           | c               | •       | 34        |
| 7136        | Questione concerning electrical circuit protective devices - finding identifies inappropriate device, situation is acceptable, ECH                                       |                 | •       | 1 (1)/2   |
| 7137        | Trip setting for electrical breaker not in accordance with manufactureer's recommendation - settings are in accordance with manufacturer's recommendations               | C               | € ,     | 35        |
| 71 30       | Lock of indication for channel bypass/inoperable status - not applicable for APM system                                                                                  |                 |         | 1 (1)     |
| F139        | Two SCH cover sheets utilizing same number                                                                                                                               |                 | t PL    | 1 (1)     |
| F140        | Insufficient documentation to justify environmental qualification of AFN pump motor drives - previously identified, NCR                                                  | ċ               | c       | 19        |

|              |                                                                                                                               | Iorel 1 | Irvel 3    | Seteman |
|--------------|-------------------------------------------------------------------------------------------------------------------------------|---------|------------|---------|
| <b>7141</b>  | Questions concerning cable recovey merkings and termination error - error on externel connection draping, SCR                 | C       | 8 PL       | 3       |
| F142         | Doe of wrong cable type for HD AFV pump - termination information was in error, correct cable wood, HCR                       | E       | 1 %        | 13      |
| <b>F143</b>  | Termination tickets do not agree with connection diagram - termination tickets do agree with connection diagram               | . 1     |            | 1 (1)   |
| F144         | Some instrumentation and controls not environmentally qualified for HELD-SURES 0588 program will accure qualification         | c       | •          | 19      |
| 7300         | Incompatibility between sec. chem food and APM process piping - proviously identified by GEDG, BCM                            | •       | •          | 1 (2)   |
| 7301         | Minimum well thickness of system piping - cale given to 867                                                                   |         | 1          | 1 (1)   |
| 7302         | TTIFE not described in PSAR - but in letter to MRC                                                                            | •       |            | 1 (1)   |
| F303         | Discrepancies between two parts of FRAR - not discrepancy between licensing application and the design and construction       | C       | o PL       | •       |
| F304         | Valve acceleration form/stress qual, table not in problem file - are in file package                                          | R       | •          | •       |
| 7305         | See 7304                                                                                                                      | 2       |            | 4       |
| F306         | See 7304                                                                                                                      |         |            | 4       |
| <b>73</b> 07 | Errors on flow diagram concerning design conditions - material adequate for design conditions, SCH                            |         | 2          | 5       |
| F308         | Errors on Bill of Materials concerning design conditions - material adequate for design conditions                            |         |            | 5       |
| <b>#309</b>  | FSAR ≠ logic diagram - FSAR revision required                                                                                 |         | <b>.</b> . | 4       |
| 7310<br>:    | Isometric # smother isometrie/TPIPE analysis - drawing revision required, ECH                                                 |         | o PL       | 6       |
| 7311         | Isometric # TPIPE analysis - support designed correctly, drawing revision required, ECH                                       | 8       |            | 1 (1)   |
| <b>7312</b>  | Questions relating to system pressure drop calculations - revised cals to show diff. 60°7-40°7                                | C       |            | 1 (1)   |
| 7313         | Sec 7304                                                                                                                      | R       | •          | •       |
| <b>F314</b>  | Errors on Bill of Materials concerning design conditions - installed material adequate for design conditions                  |         | •          | 5       |
| 7315         | Interpretation of ASME Section III for pump easing - GEDC attempted to justify position                                       | e       | •          | 1 (1)   |
| <b>F316</b>  | Cale for line sises - cals given to BAY                                                                                       | B.      |            | 1 (1)   |
| <b>F317</b>  | No calculations to support design conditions on flow diagram - piping calculations provided to MAY, piping design is adequate | B.      | •          | 1 (1)   |

|             |                                                                                                                                                                                                             | lovel 2    |      | Steener    |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------|------------|
| 7310        | Valves with g leading greater than specified in SN - TVA analysis justified velves                                                                                                                          | c          | ı.   | ı w        |
| <b>F319</b> | TPIPS analysis does not agree with anchor lead table - anchor program analysis output not conservative when compared to issued load requirements, designed anchor does not meet stiffness requirements, BCR | C          | C    | 6          |
| F320        | Lack of temp stress analysis when using fire protection connection - existing analysis accers                                                                                                               |            |      | 1 (1)      |
| F321        | Error in FRAR concerning reference to interface discussion - FRAR revision, not discrepancy between licensing application and design and construction                                                       |            | 1 %  | 31         |
| F322        | Lock of flange qualification in stress analysis - analysis done after the fact, NCR                                                                                                                         | c          |      |            |
| F323        | See 7318                                                                                                                                                                                                    | •          | -    | 25         |
| F324        | TPIPE analysis does not agree with anchor lead table - sachor program analysis output not conservative when compared to issued load requirements, designed anchor does not meet stiffness requirements, BCR | •          | 6    | •          |
| <b>7325</b> | TPIPE analysis does not agree with anchor lead table - anchor program analysis output not conservative when compared to issued load requirements, MCR                                                       | •          |      | •          |
| F326        | Interpretation of ARME Section III for pump casing - GEDC attempted to justify position using "Allowance for Variation from Design Condition" in code                                                       | c          |      | 1 (1)      |
| F327        | TPIPE enalysis does not agree with individual load cases in PSAR - calculations given to BAV, acceptable                                                                                                    |            |      |            |
| 7328        | Design temp/pressure of some valves greater than procurement spec - Valves adequate for maximum system temp/pressure, HCR                                                                                   | <b>t</b> . |      | 1 (1)<br>5 |
| 7329        | Isometrie information incomsistent - finding is in error                                                                                                                                                    |            |      | 1 (1)      |
| <b>F330</b> | Capping secondary chemical feed line, not adding block valve as discussed with HRC - acceptable solution, BCH                                                                                               |            |      | 1 (2)      |
| 7331        | Temp en atress isometrie ≠ flow diagram - used realistic and conservative temperature                                                                                                                       | 2          |      | 11         |
| 7332        | Exceed I-R pump nozzle loods - loods are exceeded, stress (due to faulted nozzle loods) is below normal allowables, analysis confirms acceptability                                                         | <b>-</b>   |      | 1 (2)      |
| 7333        | Demont of MD pumps may exceed motor rating - OEDC position is that this is acceptable for events postulated in in the finding                                                                               | c          | 1 R  | 1 (1)      |
| F334        | Verify the technical adequacy of TVA calculations which hydronlic/safety analysis is based - bounding appropria                                                                                             | •          |      | 1 (1)      |
| F335        | Valves have accelerations which exceed 2 g vertical, 3 g horizontal allowables - GEDC attempted to justify                                                                                                  | _          |      |            |
| F336        | Valves have stresses which exceed .76 By allowable stress - OEDC attempted to justify                                                                                                                       | <b>C</b>   | •    | \$         |
|             | Lock of active velve stress qual, table in file per PSAR - information is retrievable                                                                                                                       | C          | o PL | 5          |
|             | han same energen en fattfaadofg                                                                                                                                                                             |            | •    | 1 (1)      |
| 63017.02    | <b>-4-</b>                                                                                                                                                                                                  |            |      |            |

|              |                                                                                                                                                                               | Lovel 2<br>Tree | level 3 | Second |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------|--------|
| 7338         | Lack of valve accoloration ownery form in file per FSAR - information is retrievable                                                                                          |                 |         | 1 (D   |
| F339         | TPIPE (4" pipe) # flow diagram/isomatric (1-1/2" pipe) - TPIPE used correct 4" pipe                                                                                           | C               |         | 1 (2)  |
| F340         | Movement (0.0") at joint in isometric does not agree with TPIPE design table movement (0.5") - no deficiency in location and design of heager, justification provided to BAV  | C               | 2 PL    | 1 (2)  |
| <b>7341</b>  | Hovement (0.8") at joint in isometric does not agree with TPIPE design table movement (1.34") - no deficiency in location and design of hanger, justification provided to BAV | c               | e PL    | 1 (1)  |
| F342         | Anchor lood table # TPIPE printout - anchor load table was being revised                                                                                                      | E               | R       | 1 (2)  |
| <b>F343</b>  | See 7342                                                                                                                                                                      | C               |         | 1 (2)  |
| F344         | See 7342                                                                                                                                                                      | C               |         | 1 (2)  |
| <b>#345</b>  | See 7342                                                                                                                                                                      | C               |         | 1 (2)  |
| F346         | Support design load value # TPIPS analysis - NCR                                                                                                                              | C               | •       | 6      |
| F347         | No evidence of calculations for support spacing for some pump recirculting piping - NCR                                                                                       | •               | •       | 12     |
| F348         | Questions concerning heat look for HVAC - calculations given to MAY                                                                                                           |                 |         | 1 (1)  |
| F349         | No evidence that pumps designed for faulted load conditions - were evaluated and meet normal allowables                                                                       | 0               |         | 1 (1)  |
| <b>F</b> 350 | Valve, fitting, piping, and pump materials do not conform to those specified in FSAR, Table 6.1-1:- table is typical                                                          |                 |         | 1 (1)  |
| F351 ·       | No technical justification for PCV setpoint of 1215 1b/in24 (550 gal/min) - used engineering judgment                                                                         | •               | R PL    | 1 (1)  |
| ¥352         | Value for APW flow following accidents/transients and single failure not consistent - CEDC reviewed warst esse                                                                | •               | e PL    | 1 (1)  |
| <b>#353</b>  | Piping volume data not provided to BLV - calculations were provided                                                                                                           | a M             |         | 1 (1)  |
| <b>F354</b>  | Questions about flow rates during steem line break accident - worst case flows used in calculations and used by Mastinghouse                                                  | •               |         | 1 (1)  |
| F355         | Questions relating to system pressure drop calculations - resolution subject to 7312                                                                                          |                 |         | 1 (1)  |
| P356         | Isometric drawing # TFIPE analysis (support not in analysis) - dead weight hanger, not needed in analysis                                                                     |                 |         | 1 (1)  |
| <b>F</b> 357 | Restraint modeled for rigid restraint in vertical direction, support restrains exial/lateral - redecign in<br>process                                                         | ٠               | • PL    | 1 (3)  |
| 7358         | TFIFE computer dealgn loof # hanger drawing lood - hanger redealgn in progress                                                                                                | •               | •       | 1 (3)  |
| F359         | Restraint is solid strut assembly, TPIPE indicates dynamic emobber - restraint redesign in process                                                                            | •               | • PL    | 1 (3)  |

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|                   |                                                                                                                                     | lovel 2 | Lovel 3 | Setement. |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------|---------|---------|-----------|
| 7360              | Bestraint is rigid etrut assembly, TPIPS indicates dynamic emabler - restraint redesign in process                                  | •       | • n     | 1 (2)     |
| F361              | Sestraint is rigid strut assembly, TPIPS indicates dynamic snubber - restraint redesign in process                                  | •       | • PL    | 1 (2)     |
| F362              | Bestraint is rigid strut assembly, TPIPS indicates dynamic combber - restraint redesign in process                                  | •       | • n.    | 1 (2)     |
| 7363              | Hanger not installed - incomplete work                                                                                              | 2 %     | • 12    | 1 (2)     |
| F364              | Support does not allow .4-inch movement as analyzed in TPIPE and PSAR - MCR                                                         | •       | • PL    | 1 (2)     |
| <b>7365</b>       | TPIPE analysis indicates rigid restraint in Y direction, freedom in X and X direction not provided by hongar design - NCR           | c       | E       | 1 (2)     |
| <b>7366</b>       | Hanger constructed per PCR H7213, PCR H7213 rejected by SMP - constructed per PCR H8296 after rejection of<br>PCR H7213             | •       | •       | 1 (2)     |
| F367 <sub>.</sub> | TPIPS analysis indicates axial movement of .4", hanger construction does not allow - not installed per design<br>drawing, HCR       | C       | c       | 7         |
| 7368              | TPIPS computer design load # hanger drawing load - drawing had been revised with correct load                                       |         |         | 1 (1)     |
| 7369              | No restraint drawing for required restraint as indicated by TPIPE analysis - failed to revise per analysis, NCR                     | c       | c       | 14        |
| <b>7</b> 370      | Restraint designed for loads of +5000 lbs/-4000 lbs, TPIPE indicates loads of +6300 lbs/-5700 lbs - redesign is process             | . •     | •       | 1 (2)     |
| F371              | TPIPE analysis indicates lood of +760 lbs/-680 lbs, hanger design is +60 lbs/-30 lbs - failed to revise per analysis, BCR           | C       | c       | M         |
| F372              | TPIPE indicates loads of +490 lbs/-800 lbs, restraint drawing loads of +360 lbs/-360 lbs - restraint adequate per Bill of Haterials | 2       | 0 PL    | 1 (2)     |
| <b>#373</b>       | No documentation to support operating temperature used in pipe atress analysis - NCR                                                | C       | • n     | iı        |
| <b>7374</b>       | Structural adequacy of banger following reduction of tube size from 4"m4" to2"m2" - adequacy will be documented<br>by FCR H7634     | 1 0 PL  | o PL    | 1 (2)     |
| 7500              | Questions concerning g loading for seisuic response - acceptable                                                                    |         |         | 1 (1)     |
| <b>F</b> 501      | ND APV pump lube eil consele, did mot consider SSE - acceptable                                                                     |         | R       | 1 (1)     |
| <b>F</b> 502      | Containment analysis used 23 mess points, PSAR states 13 used - revise PSAR                                                         | •       | 2 76    | •         |
| <b>F</b> 503      | Transhillty of imput/output for floor response spectra - OEDG feels method is acceptable                                            | ۱ د     | •       | 1 (4)     |
| 7504              | 5% eccentricity for containment not considered as stated in PSAR - MCR                                                              | c       | c       | •         |

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|              |                                                                                                                                                                                             | Love |     | Lorel 3 | Satematz |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----|---------|----------|
| 7505         | Lock of independent checking of computer output - acceptable method utilized                                                                                                                |      |     |         | 1 (1)    |
| <b>7506</b>  | Finding to document NCE MERCENSION (excessive loads/escentric load on embodusets) elecure - extered into documented tracking program                                                        | •    | n   | • PL    | •        |
| F507         | Insufficient calculations in EDS report for estemic enclysis of Auxiliary-Control Building detailed calculations given to B4V                                                               | •    |     |         | 1 (1)    |
| F508         | Here plates designed using rigid analysis, should use flamible analysis - attempted to justify, being handled<br>by evaluation per OIE Bulletin 79-02                                       | C    |     | •       | 1 (2)    |
| F509         | Nodel of internal concrete atracture does not properly consider location of the chear conter - model in FEAR, HRC issued SER after reviewing model, OEDC adequately predicted the responses | C    |     |         | 1 (1)    |
| <b>F</b> 510 | Lack of basis for the frequencies/mole shapes used to generate spectra - acceptable method                                                                                                  |      |     |         | 1 (1)    |
| <b>7511</b>  | TFIPE analysis not properly "broadened" as required by FSAR - acceptable method used, detailed calculations given to MAY, MCR                                                               | •    |     | •       | •        |
| F512         | Horizontal response spectrum for 6.9 kV switchgear does not cavelop the E-V response apactrum for El.755.5 -<br>provided justification and detailed calculations to B6V                     | •    |     | R       | 1 (2)    |
| <b>7513</b>  | Use of multiple response spectre not per FSAR - identified as MRC inspection item, MCR                                                                                                      | c    |     | •       | 4        |
| <b>#</b> 700 | Hanger met installed - incomplete work                                                                                                                                                      |      | M.  | • n.    | 1 (2)    |
| F701         | Hanger not installed - incomplete work                                                                                                                                                      |      | M.  | • n.    | 1 (2)    |
| 7702         | Manger not installed - ancomplete work                                                                                                                                                      | R    | PL. | • R     | 1 (2)    |
| <b>7</b> 703 | Manger not welded on incide - provided design calculations to verify acceptability                                                                                                          | R    |     | 2       | 1 (1)    |
| 7704         | Hanger has overheated beam with weld, 4'-10" dis. is 2'-11", added 4" tube steel - MCR                                                                                                      | C    |     | •       | ,        |
| F705         | Excessive angle on hanger brace - acceptable deviation                                                                                                                                      |      |     |         | 1 (1)    |
| <b>7706</b>  | Honger cannot be reviewed because conscaled incide a wall sleeve - COMST has inspected and decumented configuration                                                                         |      |     |         | 1 (1)    |
| <b>F</b> 707 | Reager valded to embedded plate, did not use concrete fasteners, revised elevation 3-1/2" higher - compatible deviations                                                                    |      |     |         | 1 (1)    |
| 7706         | Excessive angle on hanger brane - acceptable deviation                                                                                                                                      |      |     |         | 1 (1)    |
| F709         | Hanger not wolded on inside - acceptable deviation                                                                                                                                          |      |     |         | 1 (1)    |
| <b>7</b> 710 | Excessive loads/occentric load on embedments - MCR, this embedment acceptable                                                                                                               | c    | n.  |         | •        |

|               |                                                                                                        | Love! | -   | iorel 3 | Salesant. |
|---------------|--------------------------------------------------------------------------------------------------------|-------|-----|---------|-----------|
| P711          | Execusive loads/occentric load on autodusents - MOR, this autodusent acceptable                        | c     | n   |         | •         |
| F712          | Excessive loads/occentric load on embedments - MCR, this embedment ecceptable                          | C     | 71. |         | •         |
| 7713          | Execusive accentric land on ambedment - FCR 18003, this ambedment acceptable                           |       |     |         | •         |
| · <b>P714</b> | Missing grout under standard instrumentation supports - incomplete work                                | C     | n   | • %     | 1 (2)     |
| 7715          | Henger not walded on incide at bottom, two wall plates used not one as on drawing - incomplete work    |       |     |         | 1 (2)     |
| <b>F716</b>   | Manger not welded on incide - acceptable deviation                                                     |       |     |         | 1 (1)     |
| 7717          | Hanger not wolded on incide - acceptable deviation                                                     |       |     |         | 1 (1)     |
| · <b>P718</b> | Hanger not welded on incide, not welded on one side at enbodment - acceptable deviation, NCR           | C     |     | • 12.   | 7         |
| F719          | Great under banger base plates is eracked and chipped - ACR                                            | c     |     | , • PL  | 7         |
| 7720 E1       | Casing went line to drain from 1D pump meither enchared nor grouted - temporary                        |       |     | • PL    | 1 (2)     |
| <b>7721</b>   | No grout under hanger base plate - incomplete work                                                     |       | PL. | • 12.   | 1 (2)     |
| F722          | Hanger anchor bolto missing - installed and finalized correctly, documentation provided to MAY         |       |     |         | 1 (1)     |
| F723 R1       | Rodo sticking up from floor are rusted - will be classed prior to grouting                             | R     |     |         | 1 (2)     |
| F724 RL       | Heed to design embedment for eccentric loads - HCR, this embedment ecceptable                          |       |     | •       | •         |
| F725 R1       | Heed calculations to verify acceptability of plate wolded to embedment - cale prove acceptability      |       |     |         | 1 (1)     |
| 7726          | Hanger has support with 6°52' attachment - MCR                                                         | c     |     | •       | 7         |
| <b>#727</b>   | Honger from to slide - Mrv. 0 documented by COMST, Nov. 901 had been issued by EM MES, incomplete work | •     | R.  | • 12    | 1 (3)     |
| 7728 BI       | Hanger not installed per drawing - ecceptable deviation                                                | R     |     |         | 1 (1)     |
| 7729 RI       | Manger not installed per drawing - acceptable deviation                                                |       |     |         | 1 (7)     |
| 7730 RI       | Meed to design embedment for eccentric loads - MCR, this embedment acceptable                          |       |     |         | •         |
| 7731 Ri       | Hangars installed 18-28 spart on embedment, maybe everetresced - HCR, this embedment ecceptable        | C     |     |         | •         |
| <b>7732</b>   | Honger free to clide - acceptable, pipe restrained in vertical direction per analysis                  | •     | n   | • 16    | 1 (5)     |
| 7733          | Honger not installed per drawing - incomplete construction                                             |       | n.  | • R     | 1 (3)     |
| F734          | Honger cotter pine missing - MCR                                                                       |       | n   | • PL    | 7         |
|               |                                                                                                        |       |     |         |           |

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|              |                                                                                                             | level 2<br><u>Tree</u> | Invol 3 | <u>Salaranza</u> |
|--------------|-------------------------------------------------------------------------------------------------------------|------------------------|---------|------------------|
| <b>7735</b>  | Henger not welded on inside - acceptable deviation                                                          | 1                      |         | ı (i)            |
| <b>F736</b>  | Manger has support with 8°21' attachment - MCR                                                              | c                      | o PL    | 7                |
| <b>2737</b>  | Hanger rod has not been installed on hanger - MCR                                                           | E                      | • 11    | ,                |
| <b>7738</b>  | Teg on heager cannot be read - acceptable                                                                   | 1 PL                   | R       | 1 (1)            |
| 7739         | No tag on henger - acceptable                                                                               | 1 PL                   |         | 1 (1)            |
| ¥740         | Excessive angle on hanger rod - acceptable deviation                                                        |                        |         | 1 (1)            |
| 7741         | Henger has red with 6°18', 8' 1-1/2" dimension should be 8'6", 1'11" should be 6" - acceptable deviations   |                        | •       | 1 (1)            |
| F742         | Hanger mode to be revised per FCR M0382 - MCR                                                               | C                      | •       | 1 (2)            |
| 7743         | Hanger tag has wrong designation - acceptable                                                               | 2 PL                   |         | 1 (1)            |
| <b>7744</b>  | Hanger not welded on inside - acceptable deviation                                                          |                        |         | 1 (1)            |
| F745         | Added plate to hanger - acceptable deviation                                                                | •                      |         | 1 (1)            |
| <b>F746</b>  | Henger not installed per drawing - redesigned by FCR H 8268                                                 |                        | 17.     | 1 (1)            |
| F747         | Hanger 10'0" dimension is 6'6", added brace plates - 10'0" dimension field verified, acceptable, EGH        | 1 PL                   | •       | 1 (1)            |
| <b>2748</b>  | Hanger support not installed - redesign/rework required, incomplete work                                    | 1 PL                   | • PL    | 1 (2)            |
| <b>2749</b>  | Hanger red has not been installed - MCR                                                                     | c                      | • 74    | ,                |
| <b>7750</b>  | Henger not wolded on inside - acceptable deviation                                                          |                        |         | 1 (1)            |
| <b>F</b> 751 | Ranger not welded on inside - acceptable deviation, drawing looking east, not south, ECH                    |                        | 2 PL    | •                |
| F752         | Hanger not welded on inside - acceptable deviation                                                          |                        |         | 1 (1)            |
| <b>F</b> 753 | Henger tag and henger drawing number should be revised - acceptable, ECH                                    |                        |         | 32               |
| F754         | Melded honger directly to embedment plate - acceptable deviation                                            |                        |         | 1 (1)            |
| ¥755         | Flate added to hanger, revised dimension - acceptable deviations                                            |                        |         | 7 (1)            |
| F756         | Manger 6'7-3/4" dimension is 7'3-3/8" - Sailed to revice per analysis, MCR                                  | c                      | c       | 14               |
| ¥757         | Hanger has more steel bracing that shows on drawing - incomplete work, modified by PCNo M8237, M8296, M8893 | •                      | •       | 1 (3)            |
| F758         | Concrete behind einch encher chipped - installation not complete                                            | 1 R                    | • PL    | 1 (2)            |

|                  |                                                                                                                                            | Love<br>_Dri |     | Lorel 3<br>Tree | <u>Catement</u> |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------|-----|-----------------|-----------------|
| P759             | Piping drawing should be revised to reflect condensate line location - revised by FCR 15091                                                |              | n   | •               | 1 (1)           |
| <b>2760</b>      | Bolts loose on einch anchor for hanger - installation not complete                                                                         |              | PL. | • PL            | 1 (2)           |
| 7761             | Hanger attached to three separate embedment plates, question adequate usids - calculations prove the tanger acceptable, UCA                |              |     |                 | 18              |
| <b>7762</b>      | AFW HD pump drain line not anchored to atructure - temporary                                                                               |              |     | • FL            | 1 (2)           |
| <b>F763</b>      | Hanger not installed per drawing - revised per FCR H-7506                                                                                  |              |     | c               | 1 (4)           |
| F764             | State runs from hanger down to unli, not up - incomplete work                                                                              |              | 74  | 0 PL            | 1 (2)           |
| P765             | Hanger wilded to ambedment plate rather then bolt on plate - secreptable deviation                                                         |              |     |                 | 1 (1)           |
| <b>F766</b>      | Hanger revised by FCR MB404, changed material, support not installed - FCR MB404 incorporated changes                                      |              |     |                 | 1 (2)           |
| ¥767             | Hanger velded to embedment plate, $9^{10^{10}}$ dimension should be $10^{15\%}$ ~ acceptable deviation, failed to seriou per analysis, BCR | ¢            | •   | c               | M               |
| £768             | Hanger valded to ashednest plate, did not use concrete fasteners - modified by FCR MS003                                                   |              |     | 8               | 1 (1)           |
| · <b>F769</b>    | Grout missing from hanger base plate - incomplete construction                                                                             |              | PL  | o PL            | 1 (3)           |
| <b>F</b> 770     | Grout missing from hanger base plate - incomplete construction                                                                             |              | PL. | • FL            | 1 (2)           |
| <b>7771</b>      | Hanger is walded to embedment plate on one end, wald length 21-1/2" - revised & acceptable per PGR M7618                                   |              |     |                 | 1 (1)           |
| <b>3</b> 772     | Henger riser closp angle was specified as 30°, is installed 22° 43° - NCR                                                                  | •            | PL. | o PL            | 7               |
| <del>1</del> 773 | Manger red angle is 40 36', cetter pine are missing - angle acceptable deviation, MCR                                                      | •            | PL  | o PL            | ,               |
| <b>2774</b>      | Hanger cotter pin missing - NCR                                                                                                            | 1            | PL. | e PL            | 7               |
| 7775             | Henger loose on pipe, welded to embedment plate - MCR, acceptable deviation                                                                | c            |     | c               | 1 (2)           |
| <b>2776</b> .    | Henger and attachment at wall is retated 90°, setter pine missing - MCR                                                                    | C            |     | •               | 7               |
| <b>2777</b>      | Henger not completely installed - incomplete work                                                                                          | 1            | R   | e PL            | 1 (5)           |
| <b>2778</b>      | Hanger has not been installed - incomplete work                                                                                            | •            | PL. | • FL            | 1 (5)           |
| 7779             | Henger has not been installed - incomplete work                                                                                            | , •          | PL. | • PL            | 1 (2)           |
| 7780             | Henger has not been installed - inscaplete work                                                                                            | ١.           | R.  | 0 PL            | 1 (3)           |
| 7781             | Manger installed per drawing, drawing marked "VOID," hanger not on piping isometrie - banger removel per tracking program                  | •            | n   | • 14.           | 1 (5)           |

|                                                      | been installed - honger revised by FCR 8-7598, redesign<br>Ament plate, 1'8" dimension should be 0'8" - acceptable deviation, failed to veries per | • |           | 12   | 1 (2) |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|---|-----------|------|-------|
| FIRE Boson on Link as a A                            | facent plate, 1'8" diseasion should be 8'8" - acceptable deviation, failed to sevies per                                                           |   |           |      |       |
| analysis, HCR                                        | •                                                                                                                                                  | ¢ |           | c    | 4     |
| 7784 Hanger wolded to embe                           | fment plate, 2'6" dimension is 11-3/8" - acceptable deviation, failed to series per                                                                | c |           | c    | M     |
| 7785 Honger Jugo not instal                          | lied on pipe, not welded on incide - incomplete construction, acceptable                                                                           |   | 71.       | e PL | 1 (2) |
|                                                      | et cotter pla missing, drawing marked "void" - being considered temporary                                                                          | • | PL.       | 0 PL | 1 (2) |
|                                                      | - rodenign/rework required                                                                                                                         | • | PL.       | • 6  | 1 (2) |
| 1788 Hanger has not been in                          | etalled - failed to revise per seelysis, NCR                                                                                                       | • | PL.       | c    | M     |
| F789 Hengar has not been is                          | stalled - incomplete work                                                                                                                          | • | PL.       | • n. | 1 (3) |
| F790 Hanger not completely                           | installed - redesign/remerk required                                                                                                               | • | PL.       | • 12 | 1 (2) |
| 7791 Henger has not been in                          | stalled - being redesigned, construction required                                                                                                  |   | <b>PL</b> | • 7L | 1 (2) |
| F792 Hanger has not been in                          | stalled - incomplete work                                                                                                                          |   | PL        | • 10 | 1 (2) |
| 7793 Hanger has loose concr                          | ete behind bese plate - reinspected and would have been acceptable                                                                                 |   | ••        | • 12 | 1 (1) |
| 7794 Honger 8'2-3/8" dimen<br>enclysis, HCR, accepts | cion is 7'4-3/8", 5'9" dimension is 4'10", not welded on incide - failed to sevice per<br>ble deviation                                            |   |           | •    | 14    |
| 7795 Hanger not walded on &                          | neide - acceptable deviation                                                                                                                       |   |           |      | 1 (1) |
| 7796 Excessive angle on hen                          | ger broce - acceptable deviation :                                                                                                                 | • |           | _    |       |
| 7797 Added plate to heager                           | <u>.</u> *                                                                                                                                         | - |           | •    | 1 (1) |
| 7798 Revised hanger ancher                           | plate - acceptable deviction                                                                                                                       | • |           |      | 1 (1) |
|                                                      | od honger, redesigned per FCR M-7597, relocation - acceptable deviation                                                                            | • |           | •    | 1 (1) |
|                                                      |                                                                                                                                                    |   |           | B    | 1 (1) |
|                                                      | ture, "MPFF" should be "ERGN" - BON, proviously identified                                                                                         | C |           | 1 %  | 1 (3) |
|                                                      | ng not on schematic drawing - Sailure to here written program, MCR                                                                                 | ¢ |           | •    | 20    |
|                                                      | ordance with wiring diagram - commection drawing wrong, MCR                                                                                        | c |           | 1 PL | 3     |
| 780) Field wiring does not a<br>deleted relay        | gree with schemetic diagram - TVA internal connection diagram to be seviced to seffect                                                             | c |           | •    | ,     |

|             |                                                                                                                                                                  | Lovel<br>_Dree |     | Lovel 3 | Salesanz. |
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| <b>P804</b> | Field wiring not in accordance with wiring diagram - commection drawing wrong, schematic diagram secreet, SCH                                                    | C              |     | 2 %     | . ,       |
| P805        | Field wiring not in accordance with achometic diagram - achometic diagram wrong, connection diagram correct, ECH                                                 | ¢              |     |         | 3         |
| F806        | Wire tag does not agree with field wiring - TVA external connection drawing wrong, incomplete construction, ECH                                                  | 8 C            |     |         | 3         |
| 7807        | Cables not tagged with division color code - tags were already installed at top of panel, would be identified during welkdown                                    | E              |     | 2 %     | · 33      |
| F808        | APW ID pump not completely installed - incomplete work                                                                                                           |                | n   | • PL    | 1 (2)     |
| F809        | Specific example of circuit identification not legible per FSAR - will be identified during transfer unlikeum, no effect on sefety                               | c              |     | 2 76.   | 33        |
| F810        | FH-3-142 not installed, tags not installed on panel 1-L-301 - incomplete work                                                                                    |                | PL. | e PL    | 1 (2)     |
| 7611        | Transfer switch has missing tag, level monitors not installed - incomplete construction                                                                          |                |     | 0 PL    | 1 (2)     |
| F812        | Improper tage on switches, level monitors not installed - incomplete construction                                                                                |                |     | 0 PL    | 1 (2)     |
| 7813        | On local panels, instrument blowdowns not connected to common blowdown header - common practice for panels with nonradioactive fluid                             | *              |     |         | 3 (3)     |
| 7814        | Panel located in congested area - accessibility is not a problem, acceptable                                                                                     | R              |     |         | 1 (1)     |
| F815        | Temporary hanger still installed - incomplete work                                                                                                               | R              | PL. | · PL    | 1 (2)     |
| 7816        | Manger has loose clamp on pipe, red not installed, no tag - temperary hanger                                                                                     |                | m   | • 71.   | 1 (2)     |
| 7817        | Hanger has loose clamp on pipe, rod not installed, no tag - temperary hanger                                                                                     |                | m.  | • PL    | 1 (2)     |
| <b>7818</b> | Manger has loose clamp on pipe, red not installed, no tag " temperary hanger                                                                                     |                | PL. | 0 PL    | 1 (2)     |
| 7819        | Hanger hits tray support - MCR                                                                                                                                   | •              | R.  | •       | 7         |
| P820        | Temperary hanger still installed - incomplete work                                                                                                               | R              | PL. | • PL    | 1 (2)     |
| P621        | Hanger supports welded to a protective device, welded to embedment plate - hanger drawing will be "voided" por redesign, constructed hanger must be removed, BCH | •              | n.  | • 11.   | 14        |
| 7822        | Henger seeled in unil sloove, assauct inspect - COMST has inspected and decumented scalingration                                                                 | a              |     |         | 1 (1)     |
| F823        | Henger welded to embedded plate rather than belted to the unli-acceptable deviation                                                                              |                |     |         | 1 (1)     |
| F824        | Manger met completely installed - incomplete work                                                                                                                | •              | PL. | • 12.   | 1 (3)     |
| F825        | Manger not completely installed - incomplete work                                                                                                                | •              | n.  | • PL    | 1 (2)     |
|             |                                                                                                                                                                  |                |     |         |           |

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|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----|----------------------------------------|--------|--------------------|
|             | Heager not installed - incomplete work                                                                                                        | •   | PL.                                    | • n    | 1 (2)              |
| <b>F626</b> | ·                                                                                                                                             | •   | PL                                     | • 7L   | 8 (2) <sub>.</sub> |
| <b>7627</b> | Hongar not inotalled - incomplete work                                                                                                        | •   | n                                      | • PL   | 1 (2)              |
| P628        | Bolt not tightened, grout not installed - incomplete work                                                                                     |     | PL.                                    | e PL   | 1 (2)              |
| F629        | Honger not installed - incomplete work                                                                                                        |     | PL.                                    | 0 PL   | 1 (2)              |
| F830        | Honger not installed - incomplete work                                                                                                        | •   |                                        | e PL   | 1 (2)              |
| <b>7831</b> | Hanger mot installed - incomplete work                                                                                                        | -   | n.                                     |        | 1 (2)              |
| 7032        | Honger not installed - incomplete work                                                                                                        | •   | PL.                                    | e M    |                    |
| 7633        | · End attachment not installed in forward bracket, one setter pin missing - incomplete work                                                   |     | PL.                                    | o PL   | 1 (2)              |
| 7034        | Henger not installed - incomplete work                                                                                                        | •   | PL.                                    | • 12   | 1 (2)              |
| P835        | Hencer set installed - intemplete work                                                                                                        | •   | PL.                                    | • %    | 1 (2)              |
| F834        | Henger not installed - incomplete work                                                                                                        | •   | PL                                     | • 14   | 1 (2)              |
| F837        | Nanger not installed - incomplete work                                                                                                        | •   | PL.                                    | • PL   | 1 (2)              |
|             | Rener met installed - incomplete work                                                                                                         | 0   | PL.                                    | • PL   | 1 (2)              |
| 7638        |                                                                                                                                               | •   | FL.                                    | o PL   | 1 (2)              |
| F039        | Manger not installed - incomplete work                                                                                                        |     | PL                                     | • PL   | 1 (2)              |
| 7840        | Henger not installed - incomplete work                                                                                                        | ۰   | PL.                                    | • PL   | 1 (2)              |
| F841        | Heager not installed - incomplete work                                                                                                        |     |                                        |        | ı m                |
| F842        | Honger seeled in protective device, cannot inspect - construction documentation provided to MAY                                               | _   | PL                                     | -      | 1 (2)              |
| P843        | Honger not installed per drawing - redecign in process                                                                                        |     |                                        |        | 1 (1)              |
| 7844        | Hanger in protective device, cannot confirm installation, elevation looking east, not couth - hanger inspected and documented, ECH            |     | l .                                    | •      |                    |
| F845        | Honger sealed in protective device, essent confirm installation, elevation locking morth, should be uset - failed to revice per analysis, NCR | •   | 3                                      | E      | 14                 |
| 7846        | Hanger sealed in protective device, connect inspect - construction documentation provided to BAY                                              | 1   | 1                                      |        | 1 (1)              |
| F847        | Manger not completely installed - incomplete work                                                                                             | 1   | R PA                                   | . • PL | 1 (2)              |
| 7648        | Monger not installed per drawing or identified FOR - acceptable deviation                                                                     | 1   | . 11                                   |        | 1 (1)              |
| /840        | sender me processes has greated as greated as                                                                                                 |     |                                        |        |                    |

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|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Berrol<br>_Break |           | Level 9 |        |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------|---------|--------|
| P849          | Bangor cato ca la of grat - eccopteblo davictica                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 8                |           | а       | B COD  |
| 170349        | Unagor apport rowled - rowled por ver unit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0                | æ         | 012     | a dad  |
| 7038          | to any control - occoptable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ם                |           | ם       | B Cad  |
| 7038          | tianger wilded to embedded plate redtor than book - exceptable (wildelin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | В                |           | В       | a dad  |
| <b>2033</b>   | thegor cet inotalied for drawing - talled to ravies for analysis, and                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0                | W         | C       | BO     |
| 170945        | the solution of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract o | ۵                | 四         | oඟ      | B COD  |
| 7099          | Congor lesoted 8-1/8" durator court when durated indicator - holica to novice for emplyolo, ES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | C                |           | G       | 88     |
| 7090          | Temporary bengos otili instaliod - insemplote work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ם                | W         | o 🕾     | B (20) |
| 7897          | 8looro chem a pipia isometric art required - olooro chem a "art of fuertia" drawing, 850                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | a                | W         | ជន      | 20     |
| 78 <b>9</b> 8 | Bongor curboro creas en piping lecemento - orong en dreving, BED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ם                | ß         | ០ឆ      | 353    |
| 2030          | Piping issues is 3°3° dissocia to 3°9°, 10°0° dissocia to 0°0° - Noid worlded correct for piping issues in                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | B B              |           | 0       | B CBD  |
| 786 <b>9</b>  | Temporary basgor odill installed - insemplate work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | В                | W         | o 🕾     | a (89) |
| 7061          | to eas a bassor - preserve for imposed (1888-487-4.21-4) accessed, does 7/10/08, as respected                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | а                | R         | ۵       | a cad  |
| 7068          | Temporory regard at 11 to the regard of the regard growth                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ۵                | SZ.       | 0 7%    | B (8D  |
| 7061          | Figing moting on images for instruct - insemplete with                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | a                | ₽.        | Ø 88    | a cad  |
| <b>786</b> 4  | to oscie and seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems of the seems | D.               | 飔         | 0 FB    | 8 (8)  |
| 786S          | Barger mader wares as piping leasetric - wrong on drawing, 868                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | B                | 83        | 888     | 38     |
| 7666          | Banger anaber aroug on piping icometric - vrong so drewing, 200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0                | æ         | 0 FL    | 333    |
| F967          | Piping has not been insulated - incomplete work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0                | <b>FB</b> | 0 R     | 8 (8)  |
| 7 <b>86</b> 8 | Ranger not installed - hanger drawing released from volded status, BER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 6                |           | ❸.      | 6      |
| 7869          | Piping has not been insulated - incomplete with                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | a                | æ         | 0 88    | e (2)  |
| <b>7870</b>   | Honger and installed - inscaplete work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 8                | PB.       | 0 PL    | 0 (S)  |
| 7071          | Hongor not lastelled - incomplete work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 8                | 88        | 0 BL    | 0 (2)  |
| 7872          | No tag en hanger - seceptable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0                |           | 8       | 669 8  |
|               | •                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                  |           |         |        |

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|              |                                                                                                                                      | _Im | _   | _Dres_ | <b>Interest</b>    |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------|-----|-----|--------|--------------------|
|              |                                                                                                                                      |     | _   | 0 PL   | 1 (2)              |
| 7873         | Henger not installed - incomplete work                                                                                               | -   | r   | • 12   |                    |
| T874         | Hanger not installed - incomplete work                                                                                               | 2   | PL. | • 7L   | j (2)              |
| F875         | Hanger not installed - incomplete construction, honger now installed per FCR MB878                                                   |     |     | • 12   | 1 (2)              |
| 7876         | Hanger not installed - incomplete work                                                                                               |     | 74  | • 72   | 1 (2)              |
| 7677         | Hanger drawing dimension 3'11" in "location plan" should be 6'6-1/2" - redesigned, reinspection by Construction required             |     | n   | o PL   | 1 (2)              |
| P878         | Hanger not installed per drawing (welded to embedment plate) - acceptable deviation                                                  |     |     |        | 1 (1)              |
| P679         | Manger not installed per drawing (plate added) - acceptable deviation                                                                |     |     |        | 1 (1)              |
| 7880         | Plate added to honger, no tag on hanger - acceptable deviations                                                                      | E   |     |        | 1 (1)              |
| 7881         | Henger not installed per drawing - incomplete work                                                                                   | R   | ?L  | R, PL  | 1 (2)              |
| F882         | Henger not installed per drawing (plate added) - acceptable deviation                                                                |     |     |        | 1 (1)              |
| 7883         | Hanger drawing should be revised - revised by FCR H6937, incomplete construction                                                     | •   | PL  | • 12   | 1 (5)              |
| 7084         | Hanger drawing should be revised - acceptable deviations, FCR M7812 not properly incorporated, MCR                                   | •   | PL  | •      | 7                  |
| 7005         | Henger not installed per drawing (welded to embedment plate) - acceptable deviation                                                  |     |     |        | 1 (1)              |
| F886         | Hanger welded to embedment plate - hanger revised by FCR 18236                                                                       |     |     |        | 1 (1)              |
| 7887         | Piping has not been insulated - incomplete work                                                                                      |     | M   | • R    | 1 (2)              |
| 7888         | Temperary heager still installed - incomplete work                                                                                   |     | R   | • PL   | 1 (5)              |
| T889         | No tag on heager - acceptable                                                                                                        |     |     |        | 1 (1)              |
| 7890         | Temperary hanger still installed - incomplete work                                                                                   | 1   |     | • n    | r ( <del>ś</del> ) |
| 7891         | Sleeve shown on piping isometric not required - used to show pipe through platform, no affect on analysis results                    | •   |     |        | 1 (1)              |
| F892         | Loose muts and boils at flange - incomplete work                                                                                     | 2   | M   | • 12   | 1 (5)              |
| 7893         | Menger configuration revised - revised per FCR M8631, incomplete construction                                                        | •   | PL. | • 12   | 1 (2)              |
| 7894         | Should confirm temperature/pressure rating as on drawing - line and valves are edequate for temperature/<br>pressure conditions, ECH | •   |     | R PL   | \$                 |
| <b>709</b> 3 | Date sheet design requirements for valves - valves capable, NOR                                                                      | •   |     | *      | 5                  |

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|              |                                                                                                                                     | Lovel 2 | Iree 1     | <b>Selection</b> |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------|---------|------------|------------------|
| Ť896         | Buta shoot ∮ design requirements for valves - valves aspeble, BCR                                                                   |         |            | 5                |
| 7897         | Data shoot # design requirements for valves - valves capable, NCR                                                                   | R       | * *        | 5                |
| P898         | Slove shown on piping isometric not required - used to show pipe through platform, no affect on analysis                            | R       |            | 1 (1)            |
| 7899         | Hanger not installed, does not show on piping isometrie, no hanger drawing - failed to review per analysis, MC                      | R C     | E          | M                |
| G900         | Sciente opertra generation program used to calculate terrional responses, but not capable - CESC understands<br>program limitations |         |            | 1 (1)            |
| 6901         | Questions concerning cable dereting and cable tray fill - provided procedures for cable reuting and justification for adequacy      | C       | <b>c</b> . | 30               |
| <b>79</b> 02 | No boils in TD APV pump section flange - incomplete work                                                                            | R PL    | • 74       | 1 (2)            |
| F903         | Temporary henger still installed - incomplete work                                                                                  | R PL    | 0 PL       | 1 (2)            |
| F904         | Hanger class on piping with no red, no number - temperary support, incomplete work                                                  | R PL    | e PL       | 1 (2)            |
| P905         | Hanger not installed - incomplete work                                                                                              | R PL    | • 22       | 1 (2)            |
| P906         | Henger not installed, no hanger drawing - incomplete construction, hanger drawing provided to NAV                                   | 0 PL    | e PL       | 1 (5)            |
| <b>79</b> 07 | Manger not installed, no honger drawing - incomplete construction, honger drawing provided to BAT                                   | 0 PL    | o PL       | 1 (2)            |
| 7908         | Piping has not been insulated - incomplete work                                                                                     | R PL    | 0 PL       | 1 (2)            |
| 7909         | Temporary hanger still installed - incomplete work                                                                                  | a PL    | o PL       | 1 (2)            |
| F910         | Sleeve on piping isometric not required - on "out of function" drawing, ECH                                                         |         | 2 PL       | 34               |
| P911         | Hanger not installed, no hanger number on piping isometrie, no hanger drawing - failed to revise per analysis, NCR                  | C       | c          | 14               |
| P912         | No drawing provided for ben anther - drawing provided for review                                                                    |         | 2          | 1 (1)            |
| <b>F913</b>  | No drawing provided for ben anchor - drawing provided for review                                                                    |         | R          | 1 (1)            |
| P914         | No drawing provided for bex anthor - drawing provided for review                                                                    |         |            | 1 (1)            |
| F915         | Hanger not installed - incomplete work                                                                                              | R PL    | 0 PL       | 1 (2)            |
| 7916         | No drawing provided for box anthor - drawing provided for review                                                                    |         |            | 1 (1)            |
| F917         | No drawing provided for bex anchor - drawing provided for review                                                                    |         |            | 1 (1)            |
| F918         | Henger not installed - incomplete work                                                                                              | R PL    | • PL       | 1 (5)            |

|                                                                                                                            |          | <u>Im</u> | <b>S</b> alesanz. |
|----------------------------------------------------------------------------------------------------------------------------|----------|-----------|-------------------|
| 7919 Flate added to heager - NCR                                                                                           | •        | • 12.     | ,                 |
| 7920 Plate added to honger - NCR                                                                                           | C        | • PL      | 7                 |
| 7921 Plate added to hanger - acceptable deviation                                                                          | R        |           | 1 (1)             |
| P922 Hanger support revised - hanger redesigned, incomplete construction                                                   | o PL     | o PL      | 1 (2)             |
| 1923 Hanger support used 2"x2" tube steel, not 4"x4" tube steel per drawing - revised by FCR 19634                         | o M      | • 74.     | 1 (D)             |
| 1924 Hanger not welfed to embedment plate, one cotter pin missing - incomplete work                                        | R PL     | • PL      | 1 (2)             |
| 7925 Hanger not installed - incomplete work                                                                                | t FL     | • 12.     | 1 (2)             |
| 7926 Hanger not installed - incomplete work                                                                                | n.       | • 12.     | 1 (2)             |
| P927 Hanger not called out on piping isometric - BCH incomplete                                                            | B        |           | 1 (2)             |
| 7928 Hanger not called out on piping isometric - ECH incomplete                                                            |          |           | 1 (2)             |
| 7929 Manger not called out on piping isometric - SCH incomplete                                                            | •        | R         | 1 (2)             |
| F930 Ranger not called out on piping isometric - ECH incomplete                                                            | R        |           | 1 (2)             |
| 7931 Renger not called out on piping isometric - BCH incomplete                                                            | <b>a</b> |           | 1 (2)             |
| 7932 Fiping isometric has wrong hanger number called out - ECH                                                             | e PL     | R PL      | 32                |
| 7933 Ranger not called out on piping isometric - BCH incomplete                                                            | •        |           | 1 (2)             |
| 7934 Piping has not been insulated - incomplete work                                                                       | a M      | • PL      | j (2)             |
| 7935 Piping has not been insulated - incomplate work                                                                       | e m      | • PL      | 1 (5)             |
| P336 Piping not improved because piping is concealed inside protective device - construction decumentation provided to BAV | R        |           | 1 (1)             |
| P937 Ranger not installed, no hanger drawing - hanger installed, documentation provided to BAV                             | R        | • PL      | 1 (1)             |
| 7938 Temperary hanger still installed - incomplete work                                                                    | a PL     | • PL      | 1 (5)             |
| 7939 Hanger number wrong on piping isometric - wrong on drowing, ECH                                                       | e M      | 2 26      | 32 `              |
| 7940 Temporary pipe still installed - incomplete work                                                                      | e PL     | o PL      | r (s)             |
| 7941 Hanger not salled out on piping isometric - BCH incomplete                                                            | R        |           | 1 (5)             |
| 7942 Hanger number wrong on piping isometric - wrong on drawing, ECH                                                       | a ra     | 2 74      | 32                |

|              |                                                                                                                                     | _Dree_ | -   | _Drae_ | Satanasz. |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------|--------|-----|--------|-----------|
| <b>P943</b>  | Temporary hanger still installed - incomplete work                                                                                  | R      | PL  | • 12   | 1 (2)     |
| P944         | Hanger has not been called out on piping isometric - ECH incomplete                                                                 | R      |     |        | 1 (2)     |
| P945         | Honger has not been called out on piping isometric - BCH incomplete                                                                 |        |     |        | 1 (2)     |
| <b>7946</b>  | Hanger has not been called out on piping isometric - ECH incomplete                                                                 | R      |     |        | 1 (2)     |
| F947         | Henger not installed, henger not on piping isometric, no hanger drawing - redesign in presses, Comstruction inspection required     | •      | n.  | • PL   | 1 (2)     |
| P948         | Piping has not been installed - incomplete work                                                                                     |        | PL. | e PL   | 1 (2)     |
| F949         | Honger not installed, honger not on piping isometrie, no honger drawing - failed to revise per analysis, MCR                        | C      |     | C      | 14        |
| P950         | Hanger on isometric but not on piping drawing, no hanger drawing, honger not installed - fieled to revise per<br>enelysis, MCR      | C      |     | •      |           |
| <b>P951</b>  | Hanger on isometric but not on piping drawing, no hanger drawing, hanger not installed - failed to revise per - analysis, MCR       | C      |     | E      | . 14      |
| <b>P9</b> 52 | Temperary hanger still installed - incomplete work                                                                                  | ÷.     | PL  | o PL   | 1 (2)     |
| F953         | Manger number not on piping isometric - ECH incomplete                                                                              | R      |     |        | 1 (2)     |
| <b>7954</b>  | Temporary honger welded to embedment plated - incomplete work                                                                       | R      | PL. | • 12   | 1 (2)     |
| 7953         | Henger on icometric but not on piping drawing, no hanger drawing, hanger not installed - failed to revise per<br>enclysis, BCR      | C      |     | E      | 14        |
| P956         | Temperary hanger still installed - incomplete work                                                                                  | R      | PL. | 0 7%   | 1 (2)     |
| <b>F9</b> 57 | Temperary henger still installed - incomplete work                                                                                  |        | PL. | e PL   | 1 (2)     |
| 7958         | Hanger not on piping isometric, no hanger drawing, hanger not installed, hanger on isometric - failed to revis<br>per analysis, NCR | • C    |     | C      | 14        |
| F959         | Temperary hanger still installed - incomplete work                                                                                  | R      | PL  | • PL   | 1 (2)     |
| <b>7960</b>  | Temperary heager still installed - incomplete work                                                                                  |        | PL. | • 72   | 1 (5)     |
| <b>7961</b>  | Piping has been revised from piping leasestric - being redesigned                                                                   | C      |     | •      | 1 (1)     |
| 7962         | Bolts not installed in flanges - incomplete work                                                                                    |        | n.  | 0 PL   | 1 (2)     |
| P963         | Manger relocated off more than 6" allowable - failed to revise per analysis, MCR                                                    | C      |     | C      | 14        |
| P964         | Manger relocated off more than 6" allowable - failed to revies per analysis, MCR                                                    | c      |     | ¢      | 14        |
|              |                                                                                                                                     |        |     |        |           |

|              |                                                                                                                                        | Lovel<br>Dree |             | 1 3             | <b>Interes</b> |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------|-----------------|----------------|
| P963         | Honger relocated off core than 6" allocable - failed to revise per analysis, MCR                                                       | C             | c           |                 | 84             |
| P966         | Hanger not called out on piping isometric - ECH incomplete                                                                             |               |             |                 | 1 (2)          |
| P967         | Hanger construction not accomplished per hanger drawing - being revised by FCR 18721                                                   |               |             |                 | 1 (2)          |
| P968         | Hanger occatruction not accomplished per hanger drawing - being revised by PCR MA37                                                    |               | •           | n.              | 1 (2)          |
| P969         | Hanger brace changed from 6" square tube steel to 10" square tube steel, deleted brace - revised per FCR MS48, incomplete construction | , •           | •           | PL <sub>.</sub> | 1 (2)          |
| 7970         | No teg on hanger, hanger partially installed - incomplete work                                                                         |               | <b>7.</b> • | PL.             | 1 (2)          |
| P971         | No tag on hanger - acceptable                                                                                                          |               |             |                 | 1 (1)          |
| F972         | No tag on hanger - acceptable                                                                                                          |               |             |                 | 1 (1)          |
| <b>F973</b>  | Installed pipe guide not shown on piping isometric - temporary supports                                                                | 0 1           | r. •        | PL.             | 1 (2)          |
| F974         | figing not insulated - incomplete work                                                                                                 | <b>a</b> 1    | r. •        | n.              | 1 (2)          |
| <b>79</b> 75 | Manger not installed, no hanger drawing - redesign in process                                                                          | c             | c           |                 | 1 (2)          |
| F976         | Wrong azimuth designated on piping isometric - wrong on drawing, EGH                                                                   |               | r. o        | PL              | 32             |
| <b>29</b> 77 | No tag on honger - deceptable                                                                                                          |               |             |                 | 1 (1)          |
| F978         | Loose henger clamp with no red and no number - temporary hanger                                                                        | <b>a</b> 1    | <b>.</b> .  | PL              | 1 (5)          |
| 7979         | Fipe guide not on piping isometric, no drowing for pipe guide - temperary supports                                                     | 0 1           | L 0         | PL.             | 1 (2)          |
| F980         | Fipe guide not on piping isometric, no drawing for pipe guide - temperary supports                                                     | 0 1           |             | PL.             | 1 (2)          |
| P98L         | Fiping has not been insulated - incomplte work                                                                                         | <b>a</b> 1    | r. •        | PL.             | 1 (2)          |
| F982         | Flatform installed in location different from that designated - on "out of function" drawing, BCB                                      |               |             |                 | 34             |
| P983         | Coupling designated 1" x 12", not 1" x 1/2" on drawing - drafting error, ECH                                                           |               |             | n.              | 32             |
| 7984         | Hanger not installed, no hanger drawing, hanger not on icometric, hanger on piping drawing - hanger not in a neitypie, ECH             | R 1           |             | PL.             | *              |
| F985         | Hanger not installed, no hanger drawing, hanger not on isometrie, hanger on piping drawing - hanger not in analysis, ECH               | • 1           |             | PL.             | ×              |
| 7986         | Hanger not installed, no hanger drawing, hanger not an isometrie, hanger on piping drawing - hanger not in analysis, ECH               |               | r c         | n               | ×              |

|              |                                                                                                                             | Love: |    | Irre . | <b>S</b> ALESCETZ |  |
|--------------|-----------------------------------------------------------------------------------------------------------------------------|-------|----|--------|-------------------|--|
| <b>P98</b> 7 | Henger not installed where shown on piping drawing - "out of function" drawing, SCH                                         | 2     | n  | R PL   | 34                |  |
| <b>F988</b>  | Hanger not installed where shown on piping drawing - "out of function" drawing, ECH                                         |       | n. | 2 PL   | 34                |  |
| P989         | Henger set installed, no henger on drawing, hanger not on isometric, hanger on piping drawing - hanger not in analysis, ECH | •     | ** | • PL   | *                 |  |
| P990         | Piping drawing does not show 8" x 6" reducer - reducer part of fabrication                                                  |       |    |        | 1 (1)             |  |
| <b>7991</b>  | Piping drawing does not show 8" x 6" reducer - reducer part of fabrication                                                  |       |    |        | 1 (1)             |  |
| P992         | Hanger not installed, no hanger on drawing, hanger not on isometrie, hanger on piping drawing - hanger not in analysis, ECH | Ł     | n. | 1 PL   | 34                |  |
| 7993         | Piping isometric drawing does not show correct elevation of hanger - "out of function" drawing, ECS                         |       | n  | a PL   | *                 |  |

#### CATROCKY

- 1. Findings which do not require evaluation for determination of corrective action.
  - 1(1) Findings for which BAV and TVA consider there to be so deviation. Information subsequently given by TVA recolved BAV finding (R) and represented a TVA position that no deviation existed with respect to licensing or internal consistents.

Exember

- FIM Lock of test data for flame test of cable. TVA subsequently provided BAV with existing cable flame test recults-
- "7302 TRIPE computer program not described in FAAR, TVA subsequently provided BAY with existing licensing submittal letter to MMC.
- 1(2) MAV identified deviation from final design or construction requirements for which TVA has determined work to be incomplete, the COMST accountability system and/or an OEDC deviation control system must have identified the remaining work prior to BAF identification.

Examples

- 7357 Restraint modeled for rigid restraint in vertical direction while designed support restrains in amial/lateral directions. TVA response Ongoing corrective action for this deviation was incomplete under ECH 3196 and ECH 2576.
- 9700 Hanger not installed. TVA response Incomplete construction status was correctly reflected under accountability preram NRM QCI-1.40.
- 1(3) B&V findings which require further review to determine whether a deviation existed. OEDC disagrees with B&V identification of a deviation. Upon completion of review, all these findings must be assigned to emother appropriate category.
- 1(4) Slack and Vestch findings which are identified "confirmed" or "open" and for which the TVA position is that the functional bases of the licensing application are satisfied.
  - Example: 7503-84V stated that input and output to computer programs should be listed in order to provide hard evidence that input time-histories are same as used in PSAR.

TVA's authors provided for reading time histories from private desk files with trecesbility accomplished through desh file asses, tape numbers used for input and output and internal checks of the computer calculations.

Task Porce Conclusion: Pinding 7503 is not a deviation. Although MAY's recommended approach is relatively conier to follow, the TVA method is fully suditable and therefore catiefies the licensing bases. Therefore the TVA approach is adequate.

7763 - B4V identified a support containing a susy atrut which appeared to have exceeding pin to pin misalignment. Total misalignment was based on measurements taken by B6V inspectors. Concern use stated that binding of pinned may atrut could secur.

Test Force Graciusion: Based on field uncouriments taken by Construction Field Ingineers on April 20, 1983, etrut miseligement falls within +6° eligement telerance as required by TVA General Construction Spec 0-43. MeV's use of a construct surface on a reference line for measuring strut miseligement accounts for differing task force constructor.

He further action is required.

2. This category has been eliminated and all findings placed in other estegories.

- 3. Logic/control drawings do not agree with electrical drawings NCB MBHBMP8267.
- 4. Failure to design/meintain design records as apocifically described in PSAR HCMs CENCEDS213, CENCEDS213, CENCEDS213, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENCEDS215, CENC
- 5. Procurement forms and flow diagrams specified different requirements for verieus velves 80hs 484828287.
- Discrepancies between design documents (analysis results, lead tables, isometric drawings, flow diagrams, etc.) used in the design of piping systems - BCRs MSHCESS232, MSHCESS233, MSHCMF8272, MSHCMF8305, MSHCMF8305, MSHCMF8312, MSHCMF8262.
- 7. Monconforming conditions in construction of proviously inspected and accepted pipe supports MCNo 4454R (R1), 4455R (R0), 4464R (R0), 4455R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0), 4464R (R0),
- 8. This item has been resssigned to Note 4.
- 9. Failure to adequately control and evaluate embedded plate especity when multiple attachments were made to the plate by Construction BCB WENCESS203.
- 10. This item has been recogigned to Note 7.
- 11. Inadequate documentation of operational modes date used in the analyses of piping systems NOR MERCENS215.
- 12. Failure by EN SES and COMST to properly implement and document the alternate analysis criteria for esistically supported piping MCNo MONOMORISE, MENCESSE231, 4164 R.
- 13. Termination information on the documentation was in error and was not updated to reflect the actual configuration NCR 4542R.
- 14. Various supports on the ATV systems have not been modified, redesigned, or initially designed per syrised analysis of ECH 2576 ECR MEMBERSEL RI.
- 15. This item has been resestaned to Note 4.
- 16. This item has been recoggned to Note 6.
- 17. This item has been resesioned to Note 7.
- 18. A technical note on a piping support drawing (47A050-17 Note 3) was found to be invalid for some applications MCR MRMRP\$273.
- 19. Equipment connot be determined to be environmentally qualified to NURRO-0548 NCMs unmarrally, unmarrally,
- 20. He precedure for documenting time delay relay settings that are determined by presperational tests and the presperational test did not identify or require the determining of these settings NCR NAMESSEES.
- 21. This item has been recoglaned to Note 4.
- 22. This item has been recorigued to Note 32.
- 23. The entitlery feed pump turbine trip and throttle velve POV-1-51 is not included in the active valve list. The design of the valve exhaustic descent include the required control room bypass and test indication, nor automatic bypass of the "open" torque suitab HCR MRHHREEZPO.
- 24. This item has been resestaned to Mate 19.
- 25. Florge evaluations were emitted in some analysis saleulations NCR WHNCH38222 R1.

- 26. These items have been reconigned to Hote 6.
- 27. This item has been reconigned to Note 4.
- 28. This item has been reassigned to Note 6.
- 29. This item has been split and resesigned to Notes 7 and 12.
- 30. Failure to satisfy design eriteria for conitoring 1) operability and 2) providing edequate electrical protective devices for the meter-d
- 31. Editorial discrepancies in licensing documents.
- 32. Incompatible honger drawings and piping isometries MCR MARKATSAN.
- 33. Inadequate cable tagging.
- 34. "Out of function" feature of a drawing was not in agreement with the lastest design drawing the detailed design of the "out of function"
- 35. Instantaneous trip setting for meter-operated velve breakers is not in accordance with SH MES criteria and vendor recommendations.
- 36. The cable tray fill eritoria (PAR section 8.3.1.4.3) is not assured of being not because of the loss than seasorvetive namical values used for
- 37. Valve wiring circuits are designed such that the red and green indicating lights on the unit control board will light dialy upon unlimetion of
- 38. Evaluation to determine if design of thermal overload bypass circuits unt requirements of counitments to 88 1.106 and ERRE 279-1971.
- 39. The specific configuration of 6.9-hV bundled cables in trays has not been tested for the effects of fire retardent conting on the empacity of the

## TABLE 2

A STATE OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PAR

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# FINAL CATEGORIES AND ASSOCIATED BAY FINDINGS

| CATEGORY |                                                                                                                                     | BAV<br>Finding Nos.                                                      |
|----------|-------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
|          |                                                                                                                                     |                                                                          |
| 3        | Logic/control drawings do not agree with electrical drawings                                                                        | F101, F102, F103, F104, F105, F106, F107, F110, F111, F114,              |
|          |                                                                                                                                     | F115, F116, F117, F123, F124,<br>F127, F129, F130, F131, F141,           |
|          |                                                                                                                                     | 7802, 7803, 7804, 7805, 7806                                             |
|          | Failure to design/maintain design records<br>for AFW system as specifically described                                               | F118, F121, F303, F304, F305, F306, F309, F313, F502, F504,              |
|          | in FSAR                                                                                                                             | <b>7511, F513</b>                                                        |
| 5        | Procurement forms & flow diagrams specified                                                                                         | F307, F308, F314, F328, F335,                                            |
|          | different requirements for various valves                                                                                           | 7336, 7894, 7895, 7896, 7897                                             |
| 6 .      | Discrepancies between design documents<br>(analysis results, load tables, isometric<br>drawings, flow diagrams, etc.) used in the   | P310, F319, F324, F325, F346<br>F571, F868                               |
|          | design of piping systems                                                                                                            |                                                                          |
| 7        | Monconforming conditions in construction                                                                                            | F367, F704, F718, F719, F726,                                            |
|          | of previously inspected and accepted pipe supports                                                                                  | \$734, \$736, \$737, \$749, \$772,<br>\$773, \$774, \$776, \$819, \$884, |
|          |                                                                                                                                     | <b>F919</b> , F920                                                       |
| 9        | Pailure to adequately control and evaluate                                                                                          | P506, F710, F711, F712, F713,                                            |
|          | embedded plate capacity when multiple attachments were made to the plate by COMST                                                   | F724R1, F730R1, F731R1                                                   |
| 11       | Inadequate documentation of operational modes data used in the analyses of piping systems                                           | F331, F373                                                               |
| 12       | Failure by EM DES & COMST to properly<br>implement and document the alternate analysis<br>criteria for seismically supported piping | P347                                                                     |
| 13       | Termination information on the documentation was in error and was not updated to reflect the actual configuration                   | <b>F142</b>                                                              |

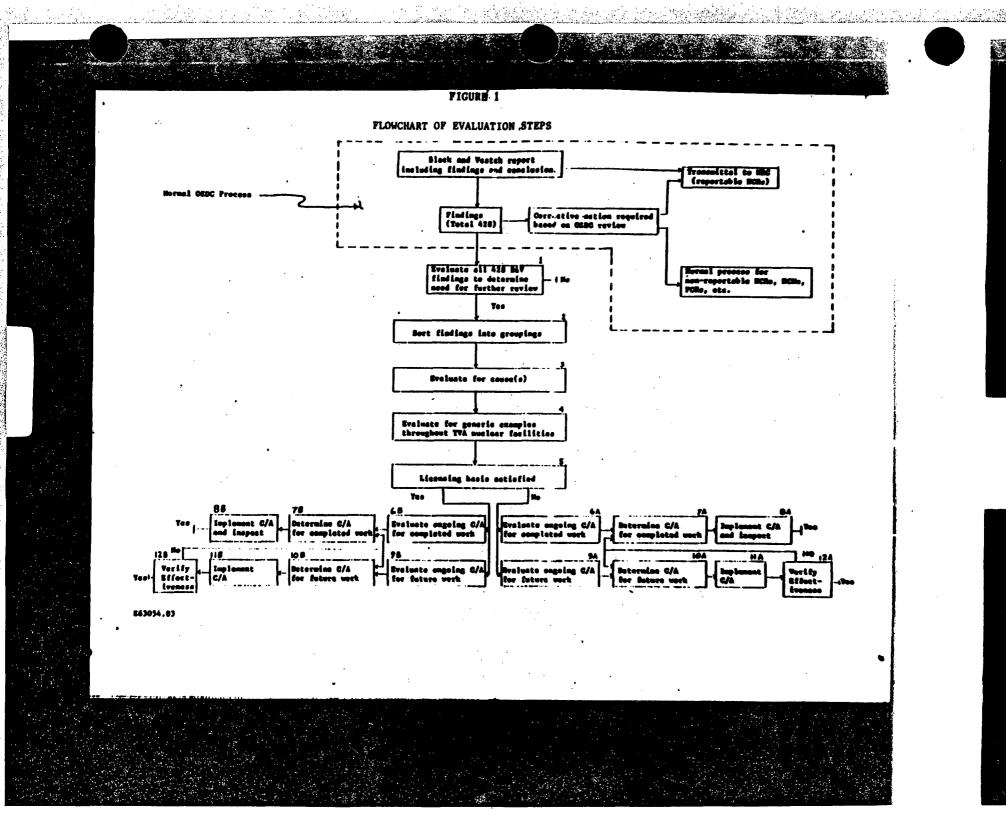
TABLE 2

## FINAL CATEGORIES AND ASSOCIATED BAY FINDINGS

| TASK FORCE CATEGURY |                                                                                                                                                                                                                                                                      | PINDING NOS.                                                                                                                                   |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| 14                  | Various supports on the AFW systems have not<br>been modified, redesigned, or initially<br>designed per revised analysis of ECH 2576                                                                                                                                 | #369, #371, #756, #767, #783,<br>#784, #788, #794, #845, #853,<br>#855, #899, #911, #949, #950,<br>#951, #955, #958, #963, #964,<br>#965, #821 |
| 18                  | A technical note on a piping support drawing (47A050-IT Note 3) was found to be invalid for some applications                                                                                                                                                        | <b>F761</b>                                                                                                                                    |
| 19                  | Equipment cannot be determined to be environmentally qualified to NURRG-0588                                                                                                                                                                                         | F140', F144                                                                                                                                    |
| 20                  | Mo procedure for documenting time delay relay<br>settings that are determined by preoperational<br>tests and the preoperational test did not<br>identify or require the documenting of these<br>settings                                                             | F113, F125, F126, F132, F801                                                                                                                   |
| 23.                 | The auxiliary feed pump turbine trip and throttle valve FCV-1-51 is not included in the active valve list. The design of the valve schematic does not include the required control room by-pass & test indication, nor automatic bypass of the "open" torque switch. | F128, F133                                                                                                                                     |
| 25                  | Flange evaluations were omitted in some analysis calculations.                                                                                                                                                                                                       | F322                                                                                                                                           |
| 30                  | Failure to satisfy design criteria for monitoring 1) operability and 2) providing adequate electrical protective devices for the motor-driven auxiliary feedwater pump lube oil pump.                                                                                | F100, F136                                                                                                                                     |
| 31                  | Editorial discrepancies in licensing documents.                                                                                                                                                                                                                      | F119, F321                                                                                                                                     |

# FINAL CATEGORIES AND ASSOCIATED BLV FINDINGS

| TASK FORCE | CATEGURY DESCRIPTION                                                                                                                                                                                                                             | FINDING NOS.                                                           |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| 32         | Incompatible hanger drawings and piping isometrics.                                                                                                                                                                                              | 7753, 7858, <b>7865, 7866, 79</b> 32,<br><b>7939, 7942, 7976, 7983</b> |
| 33         | Inadequate cable tagging.                                                                                                                                                                                                                        | <b>78</b> 07, <b>78</b> 09                                             |
| 34         | "Out of function" feature of a drawing was<br>not in agreement with the latest design<br>drawing showing the detailed design of the<br>"out of function" feature.                                                                                | F857, F910, F982, F984, F985,<br>F986, F987, F988, F989, F992,<br>F993 |
| 35         | Instantaneous trip setting for motor-operated valve breakers is not in accordance with EM DES criteria and vendor recommendations.                                                                                                               | F137                                                                   |
| 36         | The cable tray fill criteria (PSAR section 8.3.1.4.5) is not assured of being met because of the less than conservative nominal values used for cable cross sectional areas in the cable routing program.                                        | <b>7135</b>                                                            |
| 37         | Valve wiring circuits are designed such that<br>the red and green indicating lights on the unit<br>control board will light dimly upon malfunction<br>of the P-auto contact of the Westinghouse W-2<br>control switch on the unit control board. | F112                                                                   |
|            | Evaluation to determine if design of thermal overload bypass circuits met requirements of commitments to RG 1.106 and IEEE 279-1971.                                                                                                             | F108, F122                                                             |
|            | The specific configuration of 6.9-kV bundled cables in trays has not been tested for the effects of fire retardant coating on the ampacity of the cable.                                                                                         | G901                                                                   |



### APPENDIX A

## TASK FORCE MEMBERS

## This task force consisted of:

- H. L. Jones, Staff Specialist, Nuclear Engineering Support Branch, and OEDC Project Manager for the Black and Veatch Review (Chairman)
- E. H. Cole, Assistant to the Watts Bar Design Project Manager
- D. R. Denton, Principal Civil Engineer, Civil Engineering Support Branch
- J. A. McDonald, Chief, Quality Improvement Staff, Office of Quality Assurance and former NRC Resident Inspector at Watts Bar
- R. W. Olson, Principal Construction Engineer, Watts Bar Muclear Plant
- R. C. McKay, Supervisor, 79-14 Program, Watts Bar Muclear Plant (Replaced R. W. Olson on March 9, 1983).

### APPENDIX 3

### GUIDELINES FOR COMPLETING EVALUATION

## Evaluation Step

1. The task force evaluated all 428 B6V findings to determine whether a deviation existed with respect to either TVA's licensing or internal commitments for design, construction, or operation. (It is recognized that operations preparedness was not specifically reviewed; however, indicators of deviations with respect to these commitments must be evaluated.) Categories were designated for individual findings or groups of similar findings that required further review.

Designations used for findings when evaluations by task force determines that further review is not required will be:

- 1(1) TVA and B&V consider there to be no deviation.
- 1(2) B&V identified deviation from final design or construction requirements for which TVA has determined work to be incomplete. To be incomplete, the COMST accountability system and/or am OEDC deviation control system must have identified the remaining work prior to B&V identification.

Designation used when additional input is required:

- 1(3) B&V findings which require further review to determine if deviation existed since OEDC disagrees with B&V conclusion. Upon completion of this review, all of these findings must be assigned to one of the categories.
- The task force developed the category description and listed the related Black and Vestch findings.

#### HOTE

Subsequent to the initial screening and categorization of findings the task force initiates evaluation sheets and provides its "Preliminary" appraisal of the category and needed direction for evaluation and correction based upon the task force's objective knowledge and subjective impressions. The objective is to provide an initial direction for the development of a final TVA position on the category. The responsible organization assigned by the task force must develop from an objective basis a proposed "Final" TVA position for each step of the evaluation. At the point of task force concurrence, this represents the TVA position. The task force is responsible for developing and implementing a plan for resolution of any disagreements it may have with the responsible organization.

3. Evaluation for causes: The objective of this review is to develop a basis for a plan to identify, with reasonable assurance, all similar examples of the deviation elsewhere in TVA nuclear facilities beyond the scope of the BéV review. By virtue of the unique comprehensiveness of the BéV review, this objective may be satisfied by evaluation of

THE REPORT OF

finding groupings to determine the <u>most direct</u> control system (breakdown) cause that resulted in the deviations in engineering activity results.

Working upward in the <u>procedural</u> control system, this would typically be the highest level procedural control which was inadequate (i.e. EP, QCP level vs. PRH, QAPP, IDAP level). Working upward in the <u>performance</u> system this would typically be the highest level where performance or requirement for performance was inadequate (engineer, section, branch, or division level).

Typical examples of direct causes:

- The Engineering Support Branches did not require calculations to support all aspects of design in EP XXX.
- The section supervisors did not enforce the requirement for drawing compatibility.
- The engineer and checker did not follow the design change procedure.
- 4. Evaluation for generic examples: Based upon the cause(s) identified in 3 predict the potential scope of occurrence of deviations similar to those in the grouping.
  - (a) Review all work product within that scope to identify the generic examples.
- Licensing basis satisfaction: The licensing basis is not satisfied if the design or construction deviation may not be used-as-is to satisfy

the design, construction or operation commitments of the license application. All similar examples must be corrected to bring the plant up to a base line of acceptability for licensing. Future work control must be improved in order to maintain that base line of acceptability and support a TVA conclusion that the facility has been designed and constructed in accordance with the license application.

As deviations are identified on operational units the evaluation of licensing basis satisfaction should be transmitted by the responsible organization to the task force in terms of:

- the deviation(s) may be used-as-is because the safety margin remaining exceeds the licenising basis, or
- the deviation(s) reduce the safety margin to \_\_\_\_\_ which is less
  than the licensing basis of \_\_\_\_\_, or
- the deviation(s) result in failure prediction under license basis conditions, or
- the deviation(s) effect(s) have not yet been analyzed and are due to be determined by \_\_\_\_\_.

This notification does not replace required actions under the normal evaluation and licensing notification procedures.

6,7,8. Evaluation of Corrective Action for Completed Work: The objective is to select the most cost effective solution which will bring completed work up to a base line of acceptability. To that end the selected corrective action will be implemented through existing

OEDC management control systems. These automatically require as independent verification that the product satisfies specified requirements.

- 9,10. Corrective Action for Future Work: The objective is to select the most cost effective solution which will achieve and maintain a base line of acceptability, The selected corrective action will be implemented through existing OEDC management control systems.
  - 11. Implementation of corrective action for future work: The complete corrective implementation of actions to management control systems must be identified by the responsible organization to the task force.
  - 12. Verification of effectiveness of corrective action for future work:

    The sole purpose of corrective actions to management control

    systems is to improve the probability of achieving quality work.

    Therefore once corrective actions have been implemented the

    responsible organization should determine whether work activities

    being conducted under the revised control system are resulting in

    adequate quality achievement. If not, the corrective action must

    be revised and implemented. Additionally, work performed, under

    the original corrective action is suspect and deviations occurring

    since the last base line of acceptability must be identified and

    corrected.

| MIA Task Banca San                                         | - X          | PPENDIX B                | 7age _ | <u>6 of 12</u> |
|------------------------------------------------------------|--------------|--------------------------|--------|----------------|
| TVA Task Force for<br>Neview of Black &<br>Peatch Findings |              | EVALUATION SHEET         | 2<br>D | ev.<br>Ate     |
| 1. Task Force Category                                     | for          | <del></del>              |        |                |
| 2. Task Force Category I                                   | escription a | nd Related B&V Findings: |        |                |
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| 3. Evaluation for Cause                                    |              |                          |        |                |
| A. Preliminary                                             |              |                          |        |                |
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| B. Final                                                   |              |                          |        |                |
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| 4. Evaluation for Gener                                    | ic Examples  |                          |        |                |
| A. Preliminary                                             |              |                          |        |                |
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| B. Final                                                   |              |                          |        |                |
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| 6A.   | Identification and E | Evaluation of   | Ongoing Corrective Ac | tion for Comple                       | ted York |
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| 7A. 3 | Identification of Co | rrective Action | on for Completed Work | · · · · · · · · · · · · · · · · · · · |          |
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| . Implementation and | Inspection of (  | Pa<br>Corrective Action for Completed Wor | ge 8 of 12 |
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| IA. | Implementation of | Corrective                       | Action for | Future Work   | •             | ~~ <u>~</u> ~ <u></u> |
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| 6B. | Identification an | d Evaluation                     | of Ongoing | Corrective A  | tion for Comp | leted Work            |
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| 7B. Identification of   | Corrective Acti | on for Completed Work      | 7age 10 of 12  |
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| 83. Implementation and  | Inspection of   | Corrective Action for Comp | leted Work     |
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| . Identification of Co | rrective Action for Future Work   | Page 11 of 12 |
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Page 12 of 12 TVA Task Force for Review of Slack & Veatch Findings BLACK & VEATCH EVALUATION SHEET (Continuation Sheet)

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R2 Date 3/13/84

- 1. Task Force Category 3 for Watts Bar Huclear Plant Unit 1
- Task Force Category Description and Related B&V Findings:
   Logic/control drawings do not agree with electrical drawings:
   F101, F102, F103, F104, F105, F106, F107, F110, F111, F114, F115, F116, F117, F123, F124, F127, F129, F130, F131, F141, F802, F803, F804, F805, F806.
- 3. Evaluation for Cause
  - A. Preliminary
    - Inadequate drawing/checking of drawing prior to issue.
    - Inadequate recognition of need to revise companion drawings during design change process.
  - B. Final Failure to consistently implement design review procedures as required in EM DES engineering procedure EP 4.25, "Design Review and Interface Goordination of Detailed Construction and Procurement Drawings."

Resp. Org. Concere 3 V4/64 Task Force Concurrence W/ 3 W/84

- 4. Evaluation for Generic Examples
  - A. Preliminary

Problem is generic to logic, control, schematic, and connection drawings throughout WBN Unit 1.

B. Final - To determine generic implications, WBP reviewed the component cooling (70), containment spray (72), and residual heat removal systems (74) to identify mismatches in the logic, schematic, and connection diagrams for those systems. WBP then evaluated the seriousness and important of each mismatch and of the aggregate. Based upon this review, WBP concluded that the present TVA design for all safety systems is fully adequate for correct installation and operation of Watts Bar Nuclear Plant, with two exceptions: (1) instantaneous trip settings of molded case circuit breakers, (2) functional errors on logic diagrams.

See Continuation Sheet (page 7).

Resp. Org. anapp 3 19104 Task Force Concurrence 1/2 318184

- 3. Licensing Basis Satisfaction
  - A. Preliminary

Not satisfied for safety systems identified in FSAR section 7. Satisfied for all other systems.

B. Final - FSAR Section 7 identifies functional safety requirements for all safety systems. The licensing bases was not violated for any of the identified Black and Veatch findings in this category. However, the expended, three system review described in Section 4 revealed licensing problems in two areas: (1) licensing basis was not satisfied for instantaneous ttripecttings for molded case circuit breakers, (2) licensing commitments were not satisfied for logic diagram functional requirements.

Resp. Org. Grand 3 W164 Task Porce Concurrence 716 3 V6184

- 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work
  - A. Preliminary

MCR SWP 8267 (currently nonsignificant) and ECN 3683 only address correction of B&V identified drawing errors in the auxiliary feedwater system. TVA's Level 1 response to B&V finding F101 does not address all the effects of the existence of inaccurate drawings during design, construction, and operation.

B. Final

No ongoing corrective action was in place at the time of the Black and Veatch review.

Resp. Org. ancarpy 3 14164 Task Force Concurrence 286184

- 7A. Identification of Corrective Action for Completed Work
  - A. Preliminary

All safety system logic, control, schematic, and connection diagrams need to be reviewed and revised to be consistent with design criteria and each other. As discrepancies are corrected, the impact on internal safety analyses and previous licensing submittals must also be evaluated.

B. Final - WBP initiated the following ECNs to incorporate corrective actions for the findings identified in this category: 3647, 3650, 2816 and 3683. The following FCRs were also accepted from CONST: E3458 and E3508. Additionally, WBP initiated ECNs 4358 and 4360 to correct findings identified in the expanded, three safety review addressed in Section 4. ECN 4666 has been issued to correct logic diagram errors identified in the FSAR logic review, also described in Section 4, to be completed by march 30, 1984.

Resp. Org. Course 9 3/4/84 Task Force Concurrence Affice 3/1/184

- 8A. Implementation and Inspection of Corrective Action for Completed Work
  - A. Preliminary
  - B. Final FCR E3458 Completed (SMP 830125 153); FCR E3508 Completed (SMP 830217 101); ECN 2816 Completed Closure Sheet 95 (SMP 830203 019); ECN 3334 Completed Closure Sheet 101 (WBP 830624 027); ECN 3647 Completed Closure Sheet 103 (WBP 830829 014); ECN 3650 Completed Closure Sheet 103 (WBP 830829 014); ECN 3683 Completed Closure Sheet 101 (WBP 830624 027); ECN 4358 Completed; ECN 4360 Completed Closure Sheet 118 (WBP 840123 507); ECN 4246 Completed Closure Sheet 118 (WBP 831114 521); ECN 4358 Completed; ECN 4360 Completed Closure Sheet 118 (WBP 840123 507); ECN 4246 Completed Closure Sheet 118 (WBP 840123 507); ECN 4246 Completed Closure Sheet 118 (WBP 840123 507); ECN 4246 Completed Closure Sheet 112 (WBP 831114 521); ECN 4266 issued.

Resp. Org. Comp 3/6/84 Task Force Concurrence 25/2-3/6/84

- 9A. Identification and Evaluation of Ongoing Corrective Action for Future Work
  - A. Preliminary

Task force knows of no ongoing programmatic corrective action.

B. Final

N/A

Resp. Org. Land Task Force Concurrence 316184

10A. Identification of Corrective Action for Future Work

A. Preliminary

Must be determined by evaluation of cause(s).

B. Final

Implementation of engineering procedures training and utilization program initiated by M. N. Sprouse to Those listed dated February 26, 1982 (NEB 820226 255).

Resp. Org. Lancarph 3/14/01 Task Force Concurrence 3/6/84

|     | Implementation of Corrective Action for Puture Work  A. Preliminary                           |
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|     | B. Final<br>Training in EN DES EP 4.25 completed on July 28, 1982, for I&C Section.           |
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|     | map. Org. Concurrence 3/1/64 Task Force Concurrence 2/6 3/6/84                                |
| ZA. | Verification of Effectiveness of Corrective Action for Puture Work                            |
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|     | Identification and Evaluation of Ongoing Corrective Action for Completed Work  A. Preliminary |
|     |                                                                                               |
|     | No viable ongoing corrective action for nonsafety systems.                                    |
|     |                                                                                               |
|     | B. Finel                                                                                      |
|     | NA                                                                                            |
|     |                                                                                               |
|     | Resp. Org. // Task Force Concurrence //                                                       |

| 73. Ide     | entification of Corrective Action for Completed Work                                                                                                                |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             | Preliminary                                                                                                                                                         |
|             | Corrective action should address all nonsafety systems and should correct drawi on a priority based upon system importance to nuclear safety and plant operability. |
| В.          | Finel                                                                                                                                                               |
| •           | NA                                                                                                                                                                  |
|             |                                                                                                                                                                     |
| Res         | p. Org. // Task Force Concurrence //                                                                                                                                |
| IR. Two     | legenration and Tourseller of C                                                                                                                                     |
|             | Plementation and Inspection of Corrective Action for Completed Work  Preliminary                                                                                    |
|             | retiminary                                                                                                                                                          |
|             |                                                                                                                                                                     |
|             |                                                                                                                                                                     |
| В.          | Pinel NA                                                                                                                                                            |
|             |                                                                                                                                                                     |
| Res         | p. Org. // Task Force Concurrence //                                                                                                                                |
| <del></del> |                                                                                                                                                                     |
|             | ntification and Evaluation of Ongoing Corrective Action for Future Work                                                                                             |
| A.          | Preliminary                                                                                                                                                         |
|             |                                                                                                                                                                     |
|             |                                                                                                                                                                     |
| В.          | Final                                                                                                                                                               |
|             | NA                                                                                                                                                                  |
|             |                                                                                                                                                                     |
|             |                                                                                                                                                                     |
| Res         | p. Org. // Task Force Concurrence //                                                                                                                                |

| A.        | entification of<br>Preliminary |              |          |            |             |     |   |   |
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|           |                                |              |          |            |             |     |   |   |
| в.        | Finel                          |              |          |            |             |     |   |   |
|           | NA                             |              |          |            |             |     |   |   |
|           | ,                              |              |          |            |             |     | , |   |
| Res       | ip. Org.                       |              | / 1      | lask Force | Concurrence | •   | , | , |
|           |                                |              |          |            |             |     |   |   |
|           | lementation of                 | ł Corrective | Action f | or Future  | Work        | £." |   |   |
| <b>a.</b> | Preliminary                    |              |          |            | •           | ·   | , |   |
|           |                                |              |          |            |             |     | ÷ |   |
| _         |                                |              | ; .      |            |             |     |   |   |
| В.        | Final                          |              |          |            |             |     |   |   |
|           | NA                             |              | ٠.       |            |             |     |   | * |
|           |                                |              |          |            |             |     |   |   |
| Res       | p. Org.                        |              | <u>/</u> | ask Force  | Concurrenc  | ٠   | / |   |

TVA Task Force for Review of Black & Veatch Findings

### BLACK & VEATCH EVALUATION SHEET (Continuation Sheet)

- 4. Evaluation of Generic Examples
  - B. Final (Continued)

WBP has previously addressed instantaneous trip settings on Black and Veatch category 35, including all generic examples and corrective actions. WBP is presently checking all logic diagrams contained in the WBMP FSAR against the appropriate schematic diagrams to identify any additional functional mismatches. This review will be completed by March 30, 1984.

APPENDIX C COMPLETED EVALUATION SHEETS TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R3 Date 37978

- 1. Task Force Category 4 for Watts Bar Nuclear Plant Unit 1
- 2. Task Force Category Description and Related B&V Findings:

Failure to design/maintain design records for AFW system as specifically described in the FSAR: F118, F121, F303, F304, F305, F306, F309, F313, F502, F504, F511, F513.

- 3. Evaluation for Cause
  - A. Preliminary

The design control process was not closely linked to FSAR commitments.

B. Final - TVA personnel involved in the design process on Watts Bar were not (in all instances) aware of the statements in the FSAR that describe various aspects of the plant's design for which they were responsible. Subsequently, as the Watts Bar design (and concurrent design documentation) evolved, changes in TVA's design (both in design philosophy and physical layout) have not been uniformly reflected in the FSAR via mendments to the docketed description. This assessment is applicable to both units at Watts Bar.

Resp. Org. LHOhi 3/6/04 Task Force Concurrence 2/184

- 4. Evaluation for Generic Examples
  - A. Preliminary

Given the cause and the base of findings, the situation does not lend itself to a sample approach for bounding the problem to the AFW system.

B. Final - B&V findings in this category deal primarily with discrepancies in documentation (actual versus FSAR-described) on the civil engineering design aspects of the Watts Bar AFW system. However, the discrepancies do involve other engineering disciplines (besides civil) and are of a nature such that they could not be described as documentation problems associated only with the AFW system. Therefore, additional sampling of the FSAR statements would not provide an accurate assessment of the scope of discrepancies. This assessment is applicable to both units at Watts Bar.

Resp. Org. Holin 3 1/6/64 Task Force Concurrence 21/1 3/7/84

- 5. Licensing Basis Satisfaction
  - A. Preliminary

For all examples, licensing basis is not satisfied even though there may be no safety significance.

B. Final
Certain findings in this category—F303, F304, F305, F306, F309 and F313—(i.e., location of design documentation) would not impact the licensing basis for Watts Bar. However, other findings—F118, F121, F502, F504, F511 and F513—which involve the application of design/analysis techniques different from that described in the FSAR do not appear to satisfy the plant's licensing basis. This assessment is applicable to both units at Watts Bar.

Resp. Org. Ache: 316164 Task Porce Concurrence

- 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work
  - A. Preliminary
    Hemoranda NEB 821116 265 and NEB 830117 256 represent a valid FSAR correction
    process relative to assignment of scope, responsibilities, and timeliness. The
    criteria for the actual review are not identified and therefore cannot be
    determined to be effective in finding and correcting problems similar to those
    identified by B&V. The plan also needs to provide for accountability below the
    branch chief level.
  - B. Final

See continuation sheet (page 7)

Resp. Org. Library Task Force Concurrence 3 17184

- 7A. Identification of Corrective Action for Completed Work
  - A. Preliminary

The plan in 6AA should be issued in one document with clear criteria for assessment with respect to either a date or revision level applicable.

B. Final

See continuation sheet (page 7)

Resp. Org. LHahi 3/6/84 Task Force Concurrence 3/17/84

|     | •              |     |            |    |            |       |       |        |     |      |
|-----|----------------|-----|------------|----|------------|-------|-------|--------|-----|------|
| 84. | Implementation | and | Inspection | of | Corrective | Actio | a for | Comple | 244 | Mork |

A. Preliminary

#### 3. Pinel

EN DES-SEP 83-05, "Verification of Information Presented in Final Safety Analysis Report for Watts Bar Nuclear Plant," was issued August 17, 1983 (NEB 830818 852). This SEP describes EN DES reponsibilities for performing a verification of the WBN FSAR to ensure accuracy of existing or completed work.

hasp. Org. STOLE 1 10/84 Task Porce Concurrence 26/10/84

# 9A. Identification and Evaluation of Ongoing Corrective Action for Future Hork

A. Preliminary

Task force is not aware of any action currently directed toward this objective.

B. Final

See continuation sheet (page 7)

Rasp. Org. DTCLiff 5/2/83 Task Force Concurrence 25/5/83

## 10A. Identification of Corrective Action for Future Work

A. Preliminary

The design control process needs to be revised to provide a positive link to maintenance of an accurate FSAR.

B. Final

The actions described in section 9% provide the additional controls needed to more closely tie the design control process to the FSAR. This assessment is applicable to both units at Watts Bar.

Resp. Org. ATChir 5/2/83 Task Force Concurrence 25/57.83

| 14.        | <u>Lap</u>    | lomentation of                                          | f Corrective | Action fo        | or Pature W  | ork            |              |         |    |
|------------|---------------|---------------------------------------------------------|--------------|------------------|--------------|----------------|--------------|---------|----|
|            | ٨.            | Preliminary                                             |              |                  |              |                |              |         |    |
|            |               |                                                         |              |                  |              |                |              |         |    |
|            | _             |                                                         |              |                  |              |                |              |         |    |
|            | 3.            | Final All future w upgraded the information on December | procedure:   | IOT Droces       | Sing PSAR c  | hances end     | -1           |         |    |
| 1          | pesi          | . ors. <u>DT</u>                                        | lift 113     | \$/ <i>84</i> Ta | sk Force Co  | ncurrence,     | 24/          | 1151    | 84 |
| <b>-</b> 1 | Peri          | ification of E                                          | ffectiveness | s of Corre       | ctive Actio  | a for Puty     | re Hork      |         |    |
| 4          | <b>L.</b>     | Preliminary                                             | •            |                  | ٠            | *,             |              |         |    |
|            |               |                                                         | •            | •                |              |                |              |         |    |
| 1          |               | Finel                                                   |              |                  |              |                |              |         | ٠, |
|            |               |                                                         | •            | -                |              |                |              |         |    |
| 1          | <b>le s</b> p | o. Org                                                  |              | /Tai             | sk Force Co  | :<br>ncurrence |              | / /     |    |
| . 1        | den           | tification end                                          | l Evaluation | of Ongoin        | ag Correctiv | re Action      | for Complete | ed Work |    |
| A          |               | Preliminary                                             |              |                  |              |                |              |         |    |
|            |               | H/A                                                     |              |                  |              |                |              |         |    |
|            |               |                                                         |              |                  | *            |                |              |         |    |
| B          | • 1           | Finel                                                   |              |                  |              |                |              |         |    |
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| B. Mantification    | Consequence Applies for Association and                |       |
|---------------------|--------------------------------------------------------|-------|
|                     | of Corrective Astion for Completed Work                |       |
| A. Proliminary      |                                                        |       |
| W/A                 |                                                        |       |
|                     |                                                        |       |
| B. Finel            |                                                        |       |
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| Resp. Org.          |                                                        | . , , |
|                     |                                                        |       |
| . Implementation a  | nd Inspection of Corrective Action for Completed Work  |       |
| A. Preliminary      |                                                        |       |
| H/A                 |                                                        |       |
|                     |                                                        |       |
| <u>.</u>            |                                                        | •     |
| B. Final            |                                                        |       |
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| . Identification en | d Evaluation of Ongoing Corrective Action for Future 1 | iork  |
| A. Preliminary      |                                                        |       |
| ¥/A                 |                                                        |       |
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| B. Finel            |                                                        |       |
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| •                   |                                                        |       |

| 73.    | Identification of   | Corrective Action for Peture Work             |             |  |  |  |  |  |  |  |  |  |  |
|--------|---------------------|-----------------------------------------------|-------------|--|--|--|--|--|--|--|--|--|--|
|        | A. Proliningry      |                                               |             |  |  |  |  |  |  |  |  |  |  |
|        | W/A                 |                                               |             |  |  |  |  |  |  |  |  |  |  |
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|        |                     |                                               |             |  |  |  |  |  |  |  |  |  |  |
|        | B. Final            |                                               |             |  |  |  |  |  |  |  |  |  |  |
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|        | •                   | :                                             |             |  |  |  |  |  |  |  |  |  |  |
|        | Baa- 6              |                                               |             |  |  |  |  |  |  |  |  |  |  |
|        | Resp. Org.          | Task Force Concurrence                        |             |  |  |  |  |  |  |  |  |  |  |
| <br>В. | Implementation of ( | borrective Action for Future Work             | <del></del> |  |  |  |  |  |  |  |  |  |  |
|        | A. Preliminary      | THE PARTY AND AGENCE MOLK                     | •           |  |  |  |  |  |  |  |  |  |  |
|        | H/A                 | •                                             |             |  |  |  |  |  |  |  |  |  |  |
| •      |                     |                                               |             |  |  |  |  |  |  |  |  |  |  |
|        |                     |                                               | -           |  |  |  |  |  |  |  |  |  |  |
|        | B. Finel            |                                               |             |  |  |  |  |  |  |  |  |  |  |
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| _      |                     | ·                                             |             |  |  |  |  |  |  |  |  |  |  |
|        |                     | ectiveness of Corrective Action for Future Wo | rk          |  |  |  |  |  |  |  |  |  |  |
| 4      | A. Preliminary      | •                                             |             |  |  |  |  |  |  |  |  |  |  |
|        | H/A                 |                                               |             |  |  |  |  |  |  |  |  |  |  |
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| -      | . Finel             |                                               |             |  |  |  |  |  |  |  |  |  |  |
|        | - Finel             |                                               |             |  |  |  |  |  |  |  |  |  |  |
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TVA Task Porce for Review of Black & Veatch Findings

SLACE & VEATCE EVALUATION SHEET (Continuation Sheet)

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B. Criteria required for performing a formal review of existing FSAR material will be formally provided to the RH DES organizations responsible for validating the accuracy of this information. This criteria will be specific enough to identify discrepancies similar to the type found by Black and Veatch. Formal documentation of the review work will be required from the responsible organizations (BO); however, accountability below the branch chief/project manager level will not be required in the formal transmittal of new/revised FSAR material to the Reslect Engineering Support Branch's Muclear Licensing Section (MED-MLS). Each BO will be responsible for the level of review/accountability for their perticular FSAR sections. This assessment is applicable to both units at Wetts Ber.

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B. The memorandums referenced in section 6A will be superseded by the issuence of an EM DES special engineering procedure (SEP) which will identify (a) the current status (assument no.) of the FSAR, (b) a division of responsibility (DOR) for reviewing particular FSAR sections to verify present information and/or update as required, (c) criteria to be utilized by the RO in performing this review, and (d) dates for (i) completion of the FSAR review (ii) submittal of formal verification of existing FSAR material accuracy and new/revised FSAR descriptions (reviewed and coordinated as required by EM DES-EP 2.01) to MES-MLS, and (iii) submittal of all new/revised FSAR material received by MES-MLS to POMER's Muclear Licensing Staff. This assessment is applicable to both units at Watts Bar.

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- B. The following actions taken or to be taken provide the additional assurance required that the FSAR will be more closely linked with the design control process:
  - 1. The DOR for FSAR section being developed as part of the EN DES-SEP discussed in section 7AB will serve to make affected EN DES personnel sware of their responsibility to keep the FSAR section(s) for which they are responsible up to date. The DOR will be maintained in a current status by NES-HLS and updated as required to reflect changes in section responsibilities and/or organizational realignments.
  - 2. EN DES-EPs 2.01, 2.04, and 2.05 are being consolidated into one EP to clarify the FSAR preparation/revision process within EN DES. When the revised EP is issued, the affected EN DES organizations will be formally notified and concurrently requested to emphasize to their employees the importance of compliance with the procedure.
  - 3. EN DES-EP 4.02 has been revised to require (a) the preparation of data sheets which describe PSAR changes needed as a result of an engineering change notice (ECH) and (b) verification that all required PSAR changes have been sent to MES-HLS prior to reporting by EN DES that all design work on an ECH has been completed.

This assessment is applicable to both units at Watts Bar.

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R2 Date 12/27/8:

- 1. Task Force Category 5 for Watts Bar Nuclear Plant Unit 1
- 2. Task Force Category Description and Related B&V Findings:

Procurement forms and flow diagrams specified different requirements for various valves: 1) F308, F314, F328, F894, F895, F896, F897; 2) F307; 3) F335, F336.

- 3. Evaluation for Cause
  - A. Preliminary 1) F308, F314, F328, F894, F895, F896, F897 The design change process requirements apparently did not require that a review of the adequacy of previous procurements be made and documented when design conditions were revised.
    2) F307 The drawing preparation process apparently lacks a definitive policy on the manner of presenting design and operating conditions on isometric and flow diagrams.
    3) F335, F336 The component qualification process results were not required to be simultaneously tied to the design process and procurement process.
  - B. Final 1) and 2) Our normal squadcheck and ECN process requires a review of all items affected by a design change for adequacy. Our flow and isometric diagrams list piping classifications and not actual operating pressure and temperature. Design conditions for the valves are calculated using operating temperatures and pressures. It was never intended that the valves be specified to flow diagram data. Also, misuse of the S1 ECN may have contributed to the discrepancies.

    3) As above.

Resp. Org. 70 RB sluc / 19/84 Task Force Concurrence

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- 4. Evaluation for Generic Examples
  - A. Preliminary The generic examples could be identified by: 1) F308, F314, F328, F894, F895, F896, F897 Review all safety related EEB procured valves where system design pressure/temperature conditions have changed since procurements to verify consistency of procurement documentation. 2) F307 A review of all interfaces of low pressure, normally idle systems with high pressure normally operating systems for the adequate presentation of design and operating conditions. 3) F335, F336 The examples noted by B&V represented slow documentation of qualification rather than nonperformance of the qualification. Since this was ongoing incomplete work there is no need to identify generic examples. (However, the program control does need some improvement see 10A.)
  - B. Final 1) All EEB procured valves were compared to new design pressure/ temperature conditions using AMSI class rating and no discrepancies were found.
    2) A review of all interfaces was performed and no discrepancies were found.
    3) As above.

Resp. Org. MR Reluc 1/9/84 Task Force Concurrence 28/1-1/9/84

### 5. Licensing Basis Satisfaction

### A. Preliminary

1) and 2) All examples identified thusfar are acceptable to use-as-is. However, both types of problem have the potential for resulting in a failure to meet the licensing basis. Therefore, this determination can not be made until the generic examples are identified. 3) N/A - This work was in progress.

#### B. Finel

1) and 2) All valves and interfaces were checked and found to satisfy the licensing basis. 3)  ${\rm H}/{\rm A}$ 

Resp. Org. M. R. Reluc 1/9/84 Task Force Concurrence 1/1/84

## 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

#### A. Preliminary

1) and 2) WBNEKB 8207 and ECN 3511 address the B&V findings with the following exceptions: F308 and F314. The Task Force is not aware of any corrective actions yet specified.

B. Final

H/A

Resp. Org. M R Believe / 19/84 Task Force Concurrence 1/9/84

### 7A. Identification of Corrective Action for Completed Work

#### A. Preliminary

1) The generic deviations identified in 4 should be requalified to the current design conditions. 2) The flow diagrams should be revised to accurately and consistently present the design information. 3) N/A - No deviations in completed work were substantiated.

B. Final

N/A

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| 84. | Implementation | and | Inspection | of | Corrective | Action | for | Completed | Work |
|-----|----------------|-----|------------|----|------------|--------|-----|-----------|------|

A. Preliminary

B. Finel

M/A

Resp. Org. M R Below 1/9/84 Task Force Concurrence 2/19/84

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

1), 2), and 3) Task Force is not aware of any action.

B. Final

N/A

Resp. Org. MR Below 1/7/84 Task Force Concurrence 1/9/84

10A. Identification of Corrective Action for Future Work

A. Preliminary

1) Policy needs to be established for positive reassessment of procurement affected by design changes. 2) Drawing presentation of design conditions needs to be better specified. 3) The process of requalifying components whose seismic accelerations are analysed to exceed procurement specifications needs to be formalised and included in the EP system.

B. Final

The engineering procedures in place (ECN, squadchecking, signature, further review) are adequate to prevent recurrence. EP 4.02 has been revised and a memorandum issued by menagement, controlling the use of the SI ECN. EP 5.06 has been issued (5-27-80) to control preparation and review of specifications. Together these steps should avoid the concerns identified in step 3A.

Resp. Org. M. R. B. Lew 1 19 184 Task Force Concurrence 21/10 17 187

| A. In | plementation of Corrective Action for Future Work            |                   |
|-------|--------------------------------------------------------------|-------------------|
| A.    | Preliminary                                                  |                   |
|       | •                                                            |                   |
|       |                                                              |                   |
|       | •                                                            |                   |
| В.    |                                                              |                   |
|       | Corrections identified in 10A.B are in place.                | •                 |
|       |                                                              | •                 |
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| . Ve: | rification of Effectiveness of Corrective Action for Future  | - Vanh            |
|       | Preliminary                                                  | • WOEK            |
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| В.    | Pins1                                                        | •                 |
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| В.    | Final                                                        |                   |
| ъ.    |                                                              |                   |
|       | B/A                                                          |                   |
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| 78. | A. Preliminary  W/A |           |         |         |          |          |        |         |         |          |         |  |          |
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| 83. | Lap                 | lementat: | ion and | Inspect | ion of C | orrect i | ive Ac | tion fo | r Comp  | leted Wo | rk      |  |          |
|     | A.                  | Prelimi   | nery    |         |          |          |        |         |         |          |         |  |          |
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| 93. | Iden                | tificati  | ion and | Evaluat | ion of C | ngoing   | Corre  | ctive A | ction ( | or Futu  | re Work |  |          |
|     |                     | Prelimin  |         |         |          |          |        |         |         |          |         |  |          |
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| 103.                                          | Identification o | f Corrective Acti | on for Puture | Work          |                                       |   |
|                                               | A. Preliminary   |                   |               |               |                                       |   |
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| 2B.                                           | Verification of  | Effectiveness of  | Corrective Ac | tion for Putu | re Work                               |   |
|                                               | A. Preliminary   |                   |               |               |                                       |   |
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TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

R3 3/13/84

- 1. Task Force Category 6 for Watts Bar Nuclear Plant Unit 1
- Task Force Category Description and Related B&V Findings: Discrepancies between design documents (analysis results, load tables, isometric drawings, design drawings, etc.) used in the design of piping systems: F310, F319, F324, F325, F346, F751, F868.
- 3. Evaluation for Cause
  - A. Preliminary
    - (1) Regarding findings (F319, F324, F325, F346) the cause stems from ineffective handling of interfaces between two analysis (i.e., lap zones). (2) The remaining findings appear from the initial evaluation to be random errors in the design verification process with no uniquely definable cause.
  - Whit unit 1: Regarding findings F319, F324, F325, and F346 the cause stems from:
    (la) ineffective handling of the interface region between two analyses and (lb)
    errors related to the use of the -ANCHOR program. (2) The remaining findings
    were determined to be random individual errors in the design process with no
    uniquely identifiable cause. The errors if uncorrected would not result in a
    failure of the piping pressure boundary or loss of system function. No additional
    evaluation is required.

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- 4. Evaluation for Generic Examples
  - A. Preliminary
    - (1) The scope of the evaluation for generic examples should include a review of all lap zones in Watts Bar unit 1. (2) The determination of generic examples will be made after the cause and effects of the individual findings are evaluated.
  - B. Final (1a, 1b) The scope of the evaluation for generic examples should include a review of all rigorous analyzed lap zones and anchors (effected by the -ANCHOR program) in WBM unit 1. (2) No further evaluation is required, see 3.B.(2) above.

(la, lb) The review has been completed. Thirty-two problems were identified requiring revision due to lapping deficiencies. All skewed anchors which were analyzed using the direction cosine option in question will be reanalyzed.

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- 5. Licensing Basis Satisfaction
  - A. Preliminary
    - (1) The licensing bases for these findings are not satisfied. (2) The determination of whether or not the licensing basis for the remaining findings are satisfied will be made after the findings are evaluated.
  - 5. Final (la, lb) The licensing basis for these findings is not satisfied. (2) Licensing basis is satisfied.

Resp. Org. 72 Coming 3/15/87 Task Force Concurrence 2/ 3 VL/84

- 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work
  - A. Preliminary (1) USHRC NUREG/CR-1980 addresses lapping in piping analyses. Also corrective action is in progress in response to unresolved Item 390/82-27-09 per NRC letter D.M. Verrelli to H. G. Parris dated September 10, 1982 and NCR's WBNCEB 8233, WBMSWP 8309, WBNSWP 8312, WBNCEB 8232. This appears to be an adequate approach but the task force has not fully evaluated the corrective actions. (2) No generic corrective action is identified for this group of findings.
  - B. Final

    (1a) MCRs WBMCEB8233, WBMSWP8309, WBMSWP8312, and WBMCEB8232 specifically address the findings and cause. All lapped regions are being reviewed and corrections are being made to piping analysis and support design as required. Unresolved item 390/82-27-09 is being investigated and the correctness of the WBM lapping techniques is being verified. Criteria has been issued in the rigorous analysis handbook. This correction is judged adequate. (See Continuation Sheet, page 7.)

    Resp. Org. 72 (184)
- 7A. Identification of Corrective Action for Completed Work
  - A. Preliminary
    (1) Resolve differences in lap zones analyses and results and any designs resulting therefrom. (2) All findings not identified in 3.A.1 shall be evaluated to determine whether or not the affected piping systems will fail (loss of function) if the conditions found by B&V were not corrected. This information will be used to determine if identification of other generic examples are required.
  - The plan in 6A.B. appears adequate.

B. Final

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| 84. | Implementation | and Inspection | of Corrective | Action fo | or Completed Work |
|-----|----------------|----------------|---------------|-----------|-------------------|

A. Preliminary

B. Final
(1a) All piping analysis work is complete. A total of 32 problems were revised (12 of these were reanalysed). The WBM lapping criteria has been verified by EDS (IMPELL) as being correct. Remaining design work is being tracked through NCEs WBMCEB8233, WBMSWP8309, WBMSWP8312 and WBMCEB8232. (1b) All piping analysis work is complete. All affected anchor load tables have been reissued. Remaining design work

is being tracked through MCR GEMCEB8302(R1). (2) Deviation corrected if appropriate.

Resp. Org. Ramm. 3/15/17 Task Force Concurrence

## 9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary (1) USHRC NUREG/CR-1980 addresses lapping in piping analyses. Also corrective action is in progress in response to unresolved Item 390/82-27-09 per NEC letter D.M. Verrelli to H. G. Parris dated September 10, 1982 and NGR's WHNCEB 8233, WHNSWP 8309, WHNSWP 8312, WHNCEB 8232. This appears to be an adequate approach but the task force has not fully evaluated the corrective actions. (2) No corrective action has been identified for this group of findings.

B. Final
(1a) As discussed in 6A.B the lapping criteria has been issued in the rigorous analysis handbook. (1b) As discussed in 6A.B the -ANCHOR program has been modified, the output has been modified, and the owners manual has been modified.
(2) No further corrective action is required.

Resp. Org. Teleman 3/10/84 Task Force Concurrence 21/6 3 V6/84

10A. Identification of Corrective Action for Future Work

A. Preliminary

B. Final

The action identified in 9A.B appears to be adequate.

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| Verificati          | on of Effectiven                        | ess of Corrective | Action for Futu | re Work          |          |
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| 88. | Implementation             | on and Inspe  | ction of C | orrective / | Action for Co  | mpleted Work   |     |
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| 103. | Identification                |            | ti <b>ve</b> Acti | on for Future | Work .                                |                                       |    |          |
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| 145. | Verification of A. Preliminar |            | mess of C         | Corrective Ac | tion for Futu                         | re Work                               |    |          |
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TVA Task Force for Review of Black & Veatch Findings

BLACK & VEATCH EVALUATION SHEET (Continuation Sheet)

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

B. Final - continued

(1b) MCR GENCEB8302 Rl specifically addresses this cause. The -ANCHOR program has been modified, the output has been modified, and the users manual has been modified to reflect these changes. All skewed anchors which were analyzed using the direction cosine option in question will be reanalyzed. Anchor loads will be compared to the previous design loads, and anchors will be redesigned as needed. This correction is judged adequate. (2) These were random individual errors and no further corrective action is required.

TVA Task Force for Moview of Black & Testch Findings

EVALUATION SHEET

- 1. Task Force Category 7 for Matts Bar Muclear Plant Unit 1
- 2. Task Force Category Description and Related B&V Findings: Monconforming conditions in construction of previously inspected and accepted pipe supports: 7367, 7704, 7718, 7719, 7726, 7734, 7736, 7737, 7749, 7772, 1773, 1774, 1776, 1819, 1884, 1919, and 1920.
- 3. Evaluation for Cause
  - A. Preliminary
    - -On ones involving parts removed after final inspection cause unknown.
    - -On cases involving missing welds and members different than drawing oversight.
    - -On ones involving clearance and out of tolerance cause unknown.
  - B. Final
    - -On ones involving parts removed after final inspection cause unknown.
    - -On ones involving missing welds and members different than drawing oversight.
    - -On ones involving clearance and out of tolerance Concur w/A except clearance and out of tolerance problems are usually oversights/additional unknown causes

Resp. Or Commist from 4/19/83 Task Force Concurrence 4/24 83

- 4. Evaluation for Generic Examples
  - A. Preliminary

It is assumed that these examples exist through all systems.

B. Final

These examples exist through all systems with one generic exception. Bergen-Paterson (B-P) drawing 6000-1 authorises the deletion of internal pipe side welds for box frames comprised of WF members only. The misapplication of this exemption is generic for only B-P drawings and not for TVA or EM DES drawings.

Resp. Org Chandel Chan 1/18/80 Task Force Concurrence

- 5. Licensing Basis Satisfaction
  - A. Preliminary

Hime of the 17 hangers did not satisfy the licensing basis.

B. Finel

Based on the premise that "use-as-is" disposition of MCRs will satisfy licensing basis, ten of the seventeen hangers will not satisfy it.

Resp. Or Sand Rom 4/8/83 Task Force Concurrence 4/5/ 53

- 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work
  - A. Preliminary

Corrective action is 79-14 program Phase I as defined by WBH-QCP-4.56. Corrective action is adequate.

B. Final

Concur with 6.A.

Resp. Or January . Barn 4/18/63 Task Force Concurrence

- 7A. Identification of Corrective Action for Completed Work
  - A. Preliminary

The plan in 6AA is adequate.

B. Final

Concur.

Resp. Org Choung filtre 4/18/13 Task Force Concurrence 2/1/83

- 84. Implementation and Inspection of Corrective Action for Completed Work
  - A. Preliminary

The implementation of NRC Bulletin OIE 79-14 is required prior to unit fuel loading. This requirement will ensure implementation and inspection of corrective action for completed work.

B. Finel

Concur.

Beep. Org. Thomas Raum Notes Force Concurrence De 1/1/8/83

- 9A. Identification and Evaluation of Ongoing Corrective Action for Future Work
  - A. Preliminary

It is ecceptable for TVA to continue with the progress in place and to follow up with the 79-14 progress.

B. Finel

Concur with 9.A. In addition we have corrected the misinterpretation of pipe side welds on B-P drawing through additional training of inspectors.

Resp. Or Flour Phone 4/1/83 Task Force Concurrence Defend 2/83

104. Identification of Corrective Action for Future Work

A. Preliminary

Same comment as 9AA above.

B. Final

Seme as 9A.B.

Basp. Org Mount Communa 18 A3 Task Force Concurrence 2/2-183

|    |             | lementation of                                    |                          |                      | 55                    |                        | •                      |                         |                              |     |
|----|-------------|---------------------------------------------------|--------------------------|----------------------|-----------------------|------------------------|------------------------|-------------------------|------------------------------|-----|
|    | <b>A.</b>   | Proliminary                                       |                          |                      |                       |                        |                        |                         |                              |     |
|    |             | The results o                                     | f the WBN<br>of Quali    | P unit :<br>ty Assu: | 1 79-14 :<br>rance as | inspection<br>detailed | n program<br>in memora | will be so<br>ndum (EDC | mitor <b>ed</b><br>831011 40 | 1). |
|    | 3.          | Final                                             |                          |                      | -                     |                        |                        |                         |                              |     |
|    |             | Concur.                                           | •                        |                      |                       | •                      |                        |                         |                              |     |
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| ٨. | Ver         | ification of E                                    | ffectiven                | ess of (             | brrectiv              | e Action               | for Futur              | e Work                  |                              |     |
|    | <b>A.</b>   | Preliminary                                       |                          | 4                    |                       |                        |                        |                         |                              |     |
|    |             | Implementation final design                       | n of Phase<br>and accept | e II of              | the 79-1              | 4 program              | will ver               | ify the                 |                              |     |
|    |             |                                                   |                          | : · .                |                       |                        |                        |                         |                              |     |
|    | 3.          | <b>Final</b>                                      |                          |                      |                       |                        |                        | 7                       |                              |     |
|    |             | Concur. Audit<br>No further act<br>item is closed | tion requi               | er gorup<br>ired on  | s will s<br>this Bla  | trengthen<br>ck & Vest | this pro               | gram also.<br>ry. This  | ;                            |     |
|    | Res         | p. or Dennick                                     | Parm 4                   | /18/83               | Task I                | orce Conc              | urrence _              |                         |                              |     |
| в. | Ide         | ntification en                                    | d Evaluat:               | ion of (             | agoing C              | orrective              | Action f               | or Complet              | ed Work                      |     |
|    |             | Preliminary                                       |                          |                      |                       |                        |                        |                         |                              |     |
|    |             | H/A                                               |                          |                      | ,                     |                        |                        | -*                      | •                            |     |
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|    | в.          | Final                                             |                          |                      | •                     |                        |                        |                         |                              |     |
|    | 3.          | Final                                             |                          | ÷                    |                       |                        |                        |                         |                              |     |
|    | в.          | Final                                             |                          | :                    |                       |                        |                        |                         |                              |     |
|    |             | Final                                             |                          | :                    |                       |                        |                        |                         |                              |     |

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|          | A. Preliminer   | 7                 |                            |                 |
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|          | 3. Finel        |                   |                            |                 |
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|          | Resp. Org.      | 1 14              | Task Force Concurrence     |                 |
|          | 2-1             |                   |                            |                 |
| <b>.</b> |                 |                   | Corrective Action for Comp | lc ted. Work    |
|          | A. Preliminer:  | 7                 |                            |                 |
|          | H/A             |                   |                            |                 |
|          |                 |                   |                            |                 |
|          | 3. Final        |                   |                            |                 |
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|          | Resp. Org.      |                   | Task Force Concurrence     | /_/             |
| 9B.      | Identification  | and Evaluation of | Ongoing Corrective Action  | for Future Work |
|          | A. Preliminary  | 7                 |                            |                 |
|          | N/A             |                   |                            |                 |
|          |                 |                   | •                          |                 |
|          | B. Final        | •                 |                            |                 |
|          | - · <del></del> |                   | • •                        |                 |
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| B. Identification of Corr  | ective Action for Puture Work               |       |
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| A. Preliminery             |                                             |       |
| W/A                        |                                             |       |
| ·                          |                                             |       |
|                            | •                                           |       |
| 3. Final                   |                                             |       |
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| Resp. Org.                 | Task Force Concurrence                      | . / / |
| B. Implementation of Corre | ective Action for Future Work               |       |
| A. Preliminary             |                                             |       |
| W/A                        |                                             |       |
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| B. Finel                   |                                             |       |
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|                            |                                             |       |
| Resp. Org.                 | / / Task Force Concurrence                  |       |
| B. Verification of Effecti | veness of Corrective Action for Future Work |       |
| A. Preliminary             | or contractive artiful for lattice work     |       |
| H/A                        |                                             |       |
| -,-                        |                                             |       |
|                            |                                             |       |
| B. Final                   |                                             |       |
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| Resp. Org.                 | / / Task Force Concurrence                  | , ,   |

TVA Task Force for Review of Black & Vestch Findings

EVALUATION SHEET

Rev. R2 Date 1/24/8

- 1. Task Force Category 9 for Watts Bar Buclear Plant Unit 1
- 2. Task Force Category Description and Related B&V Findings:

Failure to adequately control and evaluate embedded plate capacity when multiple attachments were made to the plate by Construction: F506, F710, F711, F712, F713, F724R1, F730R1, F731R1

- 3. Evaluation for Cause
  - A. Preliminary
    - EN DES procedures did not control or address the addition of attachments to embedded plates by Construction.
    - Installation requirements and acceptance criteria on design output documents were not adequate (construction specifications and drawings).
  - B. Final

Same as Preliminary.

Resp. Org. WBP 7/20/83 Task Force Concurrence 24/83

- 4. Evaluation for Generic Examples
- A. Preliminary

This finding applies to all embedded plates.

B. Final

Same as Preliminary.

A. Joneson Task Force Concurrence 2 7 20/83

A. Joneson

- 5. Licensing Basis Satisfaction
  - A. Preliminary
    Licensing basis is satisfied thus far since the B&V findings and the sampling
    program performed to date has not identified any examples of embedded
    plates where failure would occur. Until the sampling program is
    completed, a potential exists for the licensing basis not being satisfied.
  - R. Finel

Licensing basis is satisfied since neither the B&V findings nor the sampling program identified any plates in the sample that were structurally inadequate.

Resp. Org. WBP 1/31/84
Attropic Concurrence 1/31/84
Attropic Concurrence 7/8/83

- 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work
  - A. Preliminary
    The corrective action for MCR WBM CRB 8203 is a sample of 69 embedded plates
    to evaluate if a failure would occur in a worst case situation. Based on the
    results of the sample, further corrective action may be required. This approach
    is adequate.
  - B. Final

The corrective action for NCR WBMCKB8203 to sample 69 embedded plates was completed. No further corrective action is required.

Resp. Org. WBP 7/20/83 Task Force Concurrence 7 Re/83

- 7A. Identification of Corrective Action for Completed Work
  - A. Preliminary

The plan in 6AA appears to be adequate.

B. Final

Identification of corrective action for completed work is not required as all 69 sampled embedded plates were found to be structurally adequate.

As Resp. Org. W BP 7/20/83 Task Force Concurrence The 7R-/85

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Pinel

No corrective action for completed work is required as all 69 sampled embedded plates were found to be structurally adequate.

A) Resp. Org. USP 7/20/83 Task Force Concurrence 2/20/83

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary
Construction Specification for Watts Bar Huclear Plant H3C-928, "Locating
Attachments on Embedded Plates," provides requirements to Construction
for locating attachments on embedded plates. Hanger drawings should
reference this construction specification as required.
This plan appears to be adequate.

B. Final

Corrective action as described in A is adequate.

Al Resp. Org. WBP 7/20/83 Task Force Concurrence 2/6-7/2483

10A. Identification of Corrective Action for Future Work

A. Preliminary

Plan in 9AA appears adequate.

B. Final

Plan in 9A is adequate.

AJ Resp. Org. WBP 7/20/83 Task Force Concurrence 7/20/83

| 4.  | [mp  | lementation of                                              | Corrective | Action  | for Futur  | e Work    |          |             |              |
|-----|------|-------------------------------------------------------------|------------|---------|------------|-----------|----------|-------------|--------------|
|     | A.   | Preliminary                                                 |            |         |            |           |          |             |              |
|     |      |                                                             |            |         |            |           |          | ·           |              |
|     | B.   | Final                                                       |            |         |            |           |          |             |              |
|     |      | Appendix No. 4 instructions i to embedded pl N3C-928 will e | or handlis | g field | change re- | quests on | multiple | attachmen   | :s<br>Cetion |
|     | Res  | p. ozg. <u>A. to</u>                                        | Mon 12/    | 7/83    | Task Force | Concurre  | nce 24   | 1/m /       | المالية      |
|     |      | ification of Ef                                             | fectivene  | s of Co | rrective A | ction for | Puture W | ork         |              |
|     | A.   | Preliminary                                                 |            |         |            |           |          | •           |              |
|     |      |                                                             |            |         |            |           |          |             | • •          |
|     |      |                                                             |            |         |            |           |          |             | •            |
|     | В.   | Final                                                       |            |         | • • •      |           |          | ;           |              |
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|     | Res  | p. 0rg                                                      |            |         | Task Force | Concurre  | nce      |             | 11           |
| ١.  | Ider | ntification and                                             | Evaluation | n of On | going Corr | ctive Act | ion for  | Completed i | lork         |
|     |      | Preliminary                                                 |            |         |            |           |          | *           |              |
|     |      | H/A                                                         |            |         |            |           |          | •           |              |
|     |      |                                                             |            |         |            |           |          |             |              |
| ;   | В.   | Final                                                       |            |         |            |           |          |             |              |
|     |      |                                                             |            |         |            |           |          |             |              |
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| 78. | Ide      | entification of | Corrective Actio | ion for Completed Work                    |
|-----|----------|-----------------|------------------|-------------------------------------------|
|     | ٨.       | Preliminary     |                  |                                           |
|     |          | W/A             |                  |                                           |
|     |          |                 |                  |                                           |
|     | 3.       | Final           |                  |                                           |
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|     |          | p. Org.         |                  | Task Force Concurrence/_/                 |
| 83. | Lup      | lementation and | Inspection of G  | Corrective Action for Completed Work      |
|     | A.       | Preliminary     |                  |                                           |
|     |          | H/A             |                  |                                           |
|     |          |                 | •                |                                           |
|     | В.       | Final           | •                |                                           |
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| 9B. | Ide      | ntification and | Evaluation of Or | Ongoing Corrective Action for Future Work |
|     | A.       | Preliminary     |                  |                                           |
|     |          | H/A             |                  | •                                         |
|     |          |                 |                  |                                           |
|     | в.       | Final           |                  |                                           |
|     |          |                 |                  |                                           |
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| 108. Identification of Corrective Action for Future Work  A. Preliminary  H/A  B. Final  Resp. Org. // Task Force Concurrence //  11B. Implementation of Corrective Action for Future Work  A. Preliminary  H/A  B. Final | •                        | <del></del>    |                    |         |   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|----------------|--------------------|---------|---|
| Resp. Org                                                                                                                                                                                                                 | •                        | Trective Acti  | on for Puture Work |         |   |
| B. Final  Rasp. Org. // Task Force Concurrence //  IB. Implementation of Corrective Action for Future Work  A. Preliminary  N/A                                                                                           | •                        |                |                    |         |   |
| Resp. Org. // Task Force Concurrence //  B. Implementation of Corrective Action for Future Work  A. Preliminary  H/A                                                                                                      | M/A                      |                |                    |         |   |
| Resp. Org. // Task Force Concurrence //  B. Implementation of Corrective Action for Future Work  A. Preliminary  H/A                                                                                                      |                          |                |                    |         |   |
| B. Implementation of Corrective Action for Future Work  A. Preliminary  H/A                                                                                                                                               | B. Final                 |                | •                  |         |   |
| B. Implementation of Corrective Action for Future Work  A. Preliminary  H/A                                                                                                                                               |                          |                |                    |         |   |
| B. Implementation of Corrective Action for Future Work  A. Preliminary  M/A                                                                                                                                               |                          |                |                    |         |   |
| 13. Implementation of Corrective Action for Future Work  A. Preliminary  M/A                                                                                                                                              | Page Ang                 | , ,            |                    |         |   |
| A. Preliminary H/A                                                                                                                                                                                                        |                          |                | _ TESK LOLGS CORCE | irrence |   |
| H/A                                                                                                                                                                                                                       | B. Implementation of Cor | rrective Actio | on for Future Work |         |   |
|                                                                                                                                                                                                                           | A. Preliminary           | -              |                    |         |   |
| 3. Final                                                                                                                                                                                                                  | H/A                      |                | •                  |         |   |
| B. Finel                                                                                                                                                                                                                  |                          |                | <i>j</i> • • •     |         |   |
|                                                                                                                                                                                                                           | B. Finel                 | •              |                    |         |   |
|                                                                                                                                                                                                                           |                          |                |                    | ok.     | • |
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| Resp. Org. // Task Force Concurrence //                                                                                                                                                                                   | Resp. Org.               |                | Task Force Concu   | irrence |   |
|                                                                                                                                                                                                                           | A. Preliminary           |                |                    |         |   |
|                                                                                                                                                                                                                           | H/A                      |                |                    |         |   |
| A. Preliminary                                                                                                                                                                                                            |                          |                |                    |         |   |
| A. Preliminary                                                                                                                                                                                                            | B Wast                   |                |                    | •       |   |
| A. Preliminary                                                                                                                                                                                                            | o. Fine:                 |                |                    |         | • |
| H/A B. Final                                                                                                                                                                                                              |                          |                |                    |         | • |
| A. Preliminary H/A B. Finel                                                                                                                                                                                               | . •                      |                |                    |         |   |
| A. Preliminary H/A B. Finel                                                                                                                                                                                               |                          |                |                    |         |   |

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TVA Task Force for Review of Black & Vestch Findings

EVALUATION SHEET

Rev. <u>82</u> Date 12/27/83

- 1. Task Force Category 11 for Watts Bar Suclear Plant Unit 1
- 2. Task Force Category Description and Related B&V Findings:

Inadequate documentation of operational modes data used in the analyses of piping systems: F331 and F373.

- 3. Evaluation for Cause
  - A. Preliminary

Insufficient control of design information used in piping analysis for operating conditions.

B. Final

Same as 3.A.

Resp. Org. 72 faming 12 /57 /53 Task Force Concurrence

115184

- 4. Evaluation for Generic Examples
  - A. Preliminary

completed.

The findings suggest that other deviations may exist. The evaluation for generic examples should include a comparison of the operational modes design information contained in CEB report 76-2 with current design information for all safety-related piping systems.

B. Final
The findings suggest that other deviations may exist. A sample of piping problems will be reviewed as discussed in EN DES-SEP 82-15 (R1). This is a sample of all rigorously analyzed safety-related piping systems and includes portions of those operating modes contained in CEB report 76-2 and in other sources. The sampling program will be completed by 1/14/84. Only one problem has failed the sampling evaluation to date and only the Safety Injection System (SIS) remains to be

Resp. Org. 72 Comin 12/23 Task Force Concurrence 2/15/89

|    | -         |       |             |  |
|----|-----------|-------|-------------|--|
| 5. | Licensing | Basis | Satisfactio |  |

A. Preliminary

The licensing basis is not satisfied.

B. Final

The licensing basis is not satisfied.

Resp. Org. 72/20/73 Task Force Concurrence 2/15/99

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

NCR WENCES 8215 and EN DES SEP 82-15 add-ass the findings. SEP 82-15 does not adequately address the generic implications referred to in 4A.

B. Final

MCR WBMCEB 8215 and EM DES SEP 82-15 address the findings. SEP 82-15 (R1) includes identification and evaluation of worst case affects with the provision that the sampling program can be expanded as needed. The proper corrective action will be determined when the sampling program is completed.

Resp. Org. Z. Grand R. H. 187 Task Force Concurrence William / 15 184

7A. Identification of Corrective Action for Completed Work

A. Preliminary

All deviations found in the comparison recommended in 4A must either be resolved by (1) resnalysis of the piping systems or (2) identification and analyses of worst case(s) to justify acceptability.

B. Final

The plan in 6A.B. appears adequate.

Resp. Org. Technic R/8/65 Task Force Concurrence Western / 15784

- 84. Implementation and Inspection of Corrective Action for Completed Work
  - A. Preliminary
  - B. Final

The sample program is still in progress and will be completed by 1/14/84. The single problem that failed the evaluation has been reanalyzed. Only \$15 remains to be completed. This entire effort is being tracked through MCR MBMCES8215.

Resp. Org. 75 6 18 18 Task Force Concurrence 25/6 /15/84

- 9A. Identification and Evaluation of Ongoing Corrective Action for Future Work
  - A. Preliminary

Task force is not aware of ongoing corrective action for future work.

B. Final

There is no ongoing corrective action for future work.

Resp. Org. 72 Carrie 12/27 | Task Force Concurrence 2/15/84

10A. Identification of Corrective Action for Future Work

A. Preliminary

Programmatic correction is needed to: (1) document the control of operating condition design information and (2) improve adherence to these controls.

B. Final

In the short term, to improve documentation and control of operational modes, isometrics will be squadchecked early in the analysis to specifically confirm correct operating modes. The isometric op mode information will be clarified and updated as needed. In addition, the project system designer will inform the piping analysts in writing of any op mode change which has the potential of affecting analysis so that this effect can be reviewed. (This will be further reviewed for long-term corrective action when the WBH sampling program is completed.) See Continuation Sheet (page 7).

Resp. Org. 72 Garia 12/87/83 Task Force Concurrence 15/84

|     | ٠.          | <del></del>                                                                                        |                                                |
|-----|-------------|----------------------------------------------------------------------------------------------------|------------------------------------------------|
| la. | Lmp         | implementation of Corrective Action for Future Work                                                |                                                |
|     | ٨.          | . Preliminary                                                                                      |                                                |
|     |             | ·                                                                                                  |                                                |
|     |             | •                                                                                                  |                                                |
|     |             |                                                                                                    |                                                |
|     | 3.          | - Final                                                                                            | •                                              |
|     |             | Refer to 9A.B. Retrievable operational modes do: 1/30/86. This effort is being tracked through No. | cuments will be developed by<br>CR WBBCEB8215. |
|     | <b>L</b> es | esp. Org. 72.6-12/15 Task Force Concur                                                             | Trence 24/15784                                |
|     | V           | erification of Effectiveness of Corrective Action fo                                               |                                                |
|     |             |                                                                                                    | or farare work                                 |
|     | 4.          | • Preliminary                                                                                      |                                                |
|     |             |                                                                                                    |                                                |
|     |             |                                                                                                    |                                                |
|     | B.          | . Final                                                                                            |                                                |
|     |             |                                                                                                    |                                                |
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|     | Res         | esp. Org. // Task Force Concur                                                                     | rrence                                         |
|     | <u>.</u> :  |                                                                                                    |                                                |
|     |             | dentification and Evaluation of Ongoing Corrective A                                               | Action for Completed Work                      |
|     | Δ.          | . Preliminary                                                                                      |                                                |
|     |             | H/A                                                                                                |                                                |
|     |             |                                                                                                    |                                                |
|     | В.          | . Final                                                                                            |                                                |
|     |             | · · · · · · · · · · · · · · · · · · ·                                                              |                                                |
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|     |             |                                                                                                    |                                                |
|     |             |                                                                                                    |                                                |

| 3. Identification of G  | orrective Action | n for Completed | l Work           |           |   |
|-------------------------|------------------|-----------------|------------------|-----------|---|
| A. Preliminary          |                  |                 |                  |           |   |
| H/A                     |                  |                 |                  |           |   |
|                         |                  |                 |                  |           |   |
| B. Finel                |                  |                 |                  |           |   |
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| Resp. Org.              |                  | Task Force Co   | BCHLLeuce        |           |   |
| S. Implementation and I | Inspection of Co | orrective Actio | n for Completed  | Work      |   |
| A. Preliminary          | •                |                 | -                |           |   |
| H/A                     |                  |                 |                  |           |   |
|                         | •                |                 | . *              | •         |   |
|                         |                  |                 |                  |           |   |
| B. Final                |                  |                 |                  |           | • |
| . •                     |                  | *               |                  |           |   |
|                         |                  |                 |                  | ÷.        |   |
| Resp. Org.              |                  | Task Force Co   | ncurrence        | ,         | , |
|                         |                  |                 |                  |           |   |
| 3. Identification and E | Valuation of Or  | going Correcti  | ve Action for Fu | ture Work |   |
| A. Preliminary          | •                |                 |                  |           |   |
| M/A                     |                  |                 |                  |           |   |
|                         |                  |                 |                  |           | • |
| B. Final                |                  |                 |                  |           | • |
|                         |                  |                 |                  |           |   |
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| _                       |                  |                 |                  |           |   |
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|   | A. Proliminary               |                                                    |     |  |  |  |  |  |  |  |
|---|------------------------------|----------------------------------------------------|-----|--|--|--|--|--|--|--|
|   | B. Final                     |                                                    |     |  |  |  |  |  |  |  |
|   |                              |                                                    |     |  |  |  |  |  |  |  |
|   | Resp. Org.                   |                                                    | 11  |  |  |  |  |  |  |  |
| - | Too I amond a to be a second | A Companies Assistant Companies To A               |     |  |  |  |  |  |  |  |
|   | A. Preliminary               | f Corrective Action for Juture Work                |     |  |  |  |  |  |  |  |
|   | M/A                          |                                                    | •   |  |  |  |  |  |  |  |
|   | <b>4/ &amp;</b>              |                                                    |     |  |  |  |  |  |  |  |
|   |                              |                                                    |     |  |  |  |  |  |  |  |
| , | 8. Finel                     |                                                    |     |  |  |  |  |  |  |  |
|   |                              |                                                    | •   |  |  |  |  |  |  |  |
|   | Resp. Org.                   |                                                    | 1.1 |  |  |  |  |  |  |  |
|   |                              | Effectiveness of Corrective Action for Future Work |     |  |  |  |  |  |  |  |
|   | A. Preliminary               |                                                    | •   |  |  |  |  |  |  |  |
|   | M/A                          | •                                                  |     |  |  |  |  |  |  |  |
|   |                              |                                                    |     |  |  |  |  |  |  |  |
| 1 | B. Final                     |                                                    |     |  |  |  |  |  |  |  |
|   |                              |                                                    |     |  |  |  |  |  |  |  |

- 2. Failure to adequately train personnel.
- 3. Insdequate quality assurance Program.

### C. PECCHECENDATIONS

- \_SHP should set up a training program to ensure personnel
  assigned to perform alternate analysis are trained to the
  technical application of the criteria.
- 2. A procedure to document alternate analysis should be developed and include a verification check list and certification of compliance sheet for each alternate analysis package to ensure compliance with the requirements of the alternate analysis criteria (CES 76-5).
- Schedule and manpower commitments should provide enough time for the checkers to verify the adequacy of analysis.
- 4. A task force composed of piping designers, piping analysts, and pipe support designers should be formed in SWP to perform periodic internal audit to support QAB in the technical aspect of design.

### 3.0 AMALTTICAL TECHNIQUES

# A. WEARNESSES:

Same as documentation weaknesses before.

# B. ROOT CAUSE(S):

Same as documentation basic root cause before.

#### C. RECOMMENDATIONS:

- ise Alternate Analysis Criteria 76-5 to provide analytical model for locating seismic support which is applicable to many real-to-life situations.
- 2. Revise the 47A053 Series drawing notes to:
  - a. Include requirements for documentation of analysis, the qualification of equipment nossle loads, and effect of end point movements.
  - b. Consider effect of thermal expansion load on supports and suchors for a long, straight run of pipe where two or more in-line axial restraints are required or on supports at opposite ends of the bend where thermal movements exceed 1/16 inch.
  - c. Clarify technical terms used in the application of 47A053 and expand definition in terms of sketches or diagrams.
  - d. Provide example(s) which is/are applicable to many real situations.
- 3. Review and correct inadequacies of typical support drawings used for supports adjacent to tees and adjacent to bends when used as axial restraints of adjoining run, and as in-line axial restraints.
- 4. Form a task force to review and remove the conservation built in CER Report 76-5 after investigating and correcting adequacy of seismic support spacing and load generated based on the flexible side of the response spectra curve.

317+N5

#### 4.0 DESIGN DATA TRANSPER

### A. WEATTERES.

- Lack of quality assurance controls of design information
   (system designer analyst support designer procurement fabricator construction) for the following: valve data,
   insulation data, operating mode data, equipment data, response
   spectra.
- 2. Lack of quality assurance controls of software programs.

#### B. ROOT CAUSES

- 1. Inadequate exchange or coordination of needs and information between project to branch and branch to project.
- 2. All of the previous basic root causes identified.

# C. RECORDENDATIONS

- Recommend that EM DES EPs be developed and/or enforced that
  will assure that valve data, insulation data, equipment data,
  and response spectra data is quality assured information and
  is controlled from designer to erection.
- Recommend that piping analysis operating mode data drawings be developed, issued, and maintained.
- Recommend that all the data identified above be obtained and put into a data base file as soon as possible.
- 4. Recommend that the affect and cost of revisions to the above data be made known to the organizations responsible. The revisions must be stopped. The cost due to a delay in fuel loading because of revision causing reanalysis is generally

far more than the cost of special replacement hardware orders of identical items and/or the cost of resnalysis itself.

- Recommend that all software computer programs have a quality assured verification, authorization, and notification program administered.
- Recommend that the above data transfer recommendations be given top priority of implementation and completion.

# 5.0 ORGANIZATIONAL EFFECTIVENESS

### A. WEARNESSES:

- Lack of communication and coordination between SWP, CEB, and COMST.
- 2. Lack of training within CEB, SWP and COMST.
- 3. Inadequate analysis result.

# B. ROOT CAUSES:

- Division of Construction, not sufficiently trained to perform design work, was given the full responsibility by SWP to perform design work without EM DES supervision (review and approval of construction analysis work).
- 2. SWP mechanical sections responsible for alternate analysis (system engineers and support designers) are not sufficiently trained to do alternate analysis work; therefore, quality product is not assured.
- CEB failed to provide SWP sufficient training and guidance to implement the use of the Alternate Analysis Criteria 76-5 developed by EDS.

- 4. CRB has not reviewed in detail the technical requirements, limitations, and practical application of the criteria before issuing to SNP for use.
- CES not responsive to SNP's need to make deviation to the criteria for reason that CES has to get EDS approval.
- CES (the lead organization) failed to andit SWP's analysis to ensure compliance with the requirements of the criteria.
- 7. SWP failed to provide sufficient training to construction in the application of 47A053 notes.

### 6.0 RECORDENDATION

- Analysis performed by construction must be reviewed and approved by EM DES.
- Form a section (alternate analysis) in SNP similar to MLP and TCP to handle the following:
  - Resnalyse and document all alternate analysis problems in question.
  - b. Review and approve all variances to the alternate enalysis.
  - c. Review and approve all application of 47A053 notes performed by Construction.
  - d. Develop project procedures and guidelines in response to higher level branch criteria as needed.
  - e. Develop a training program for SWP and Construction analysts. (SWP, CEB, and Construction management personnel responsible for approving analysis will participate in the training program.)

J. C. Key, 207 GB-K W. A. English, W9C126 C-K Jack B. Thomison 240 GB-K WATTS BAR NUCLEAR PLANT - ALTERNATE ANALYSIS REVIEW A 45D from you to R. O. Barnett and J. C. Standifer dated May 18, 1982. established a review team to determine any inherent weakness in the procedures and their implementation used to alternately analyze piping for WBN.
A charter outlined the scope and assigned three team members from SWP and CEB. The attached report includes the findings of this team. Several problem areas are discussed and recommendations for correction included for your consideration. JBT: DB Attachment THE COME STREETER MAINS BUT

WATTS BAR NUCLEAR PLANT - ALTERNATE ANALYSIS REVIEW R. O. Barnett, W9D224 C-Ke - JCK:HAE:DB cc(Attachment): AThe accached report identifies root causes of problems found in the implementation of the alternate analysis program and contains the alternate analysis program and contains formed analysis program and contesting We recommend that the recommendations be implemented to the extent fessible with found. status reports made periodically until sterns tebutis mens herrogressia mere B. A. COSTNEY WILC126 C-K
J. A. Raulston, WIOC126 C-K P. Thornton, 102 SPT-K Jack-B. Thomison هر :ت Attachment

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PINDINGS

OF THE

ALTERNATE ANALYSIS REVIEW TEAM

FOR

WATTS BAR NUCLEAR PLANT

J. B. Thomison

S. D. McMahan

4. L. E1:

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#### V. ROOT CAUSES

After review of all NCR's and evaluation of the the sample packages, the following root causes of the problem seen in the WBN alternate analysis program have been identified.

- 1. Lack of Experienced Personnel: Most of these analyses have been conducted by SWP mechanical personnel who were familiar with piping system and pipe support design, but with little piping analysis experience.
- 2. Failure to Adequately Train Personnel:
  Very few SWP engineers or designers have been trained in piping analysis. Some people have been trained in TPIPE, which is a computer method used in rigorous analysis by CEB, but none have used the training at SWP. There has also been no effective effort to train people in alternate analysis.
- A good procedure could have partially compensated for the lack of experienced and trained personnel, but as identified in NCR WBNSWP8220, SWP did not have a procedure for alternate analysis.
- 4. Schedule Pressures: Pressures to meet commitments for issuing support drawings to Construction may have contributed to the lack of emphasis on control of alternate analysis.
- 5. Criteria Inadequate and not Maintained: As discussed in section III.B. of this report, the criteria used for analysis was lacking in several areas. A continuing effort should have been made to correct problems and reduce conservations.

6. Poor Coordination Between CEB, SWP, and CONST:
If CEB, SWP, and CONST had worked more closely, problems could have been recognized sooner and resolved.

# VI. RECOMMENDATIONS

After consideration of the findings discussed above, the WBM Alternate

Analysis Review Team makes the following recommendations to correct the

discrepancies found:

### . A. Procedures and Criteria

- 1. SWP, in coordination with CEB and QAB, should write and issue a procedure for performing and documenting alternate analysis. ~
  If an adequate procedure had been in place earlier, many documentation and technical discrepancies could have been avoided.
  Due to the large amount of analysis already performed, this procedure should also identify the minimum amount of rework or documentation needed to meet the criteria requirements.
- 2. Concurrently with the development of the analysis procedure, CEB report CEB-76-5 should be revised to correct technical problems and remove unnecessary conservations so that excessive rework can be avoided. Where possible, sections of the report issling with brancher, task, benue, valvas, small supports, support loads, and thermal flexibility should be revised to give less conservative rules. A procedure for evaluating flanges should be incorporated to resolve NCR WBNCEB8218. Other reports and drawings (i.e., CEB-75-9, 47A053, and other series drawings) used for alternate analysis should be reviewed and revised where necessary.

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHREET

Rev. R1 Date 5/5/83

- 1. Task Force Category 13 for Watts Bar Muclear Plant Unit 1
- 2. Task Force Category Description and Related B&V Findings:

Termination information on the documentation was in error and was not updated to reflect the actual configuration: 7142.

- 3. Evaluation for Cause
  - A. Preliminary

The example was an oversight and it is felt it is an isolated case.

B. Final
Finding F142 was an oversight and was an isolated case. A sample of 51
AFW termination records were evaluated to confirm that this finding was
an isolated case. The sample contained 31 records involving the inspector
and/or engineer on B&V finding F142 and 20 records involving others. The
terminations identified on these records were compared to the termination
diagrams. There were no errors identified on any of these records. Therefore finding F142 was an isolated case.

Resp. Org. Edburg 4/18/83 Task Force Concurrence 4/20/83

- 4. Evaluation for Generic Examples
  - A. Preliminary

To confirm that the example was isolated, the following sample should be evaluated: Compare 40 AFW termination records to the termination diagrams. The sample should contain 20 records involving the inspector and engineer on B&V finding F-142 and 20 records involving others.

B. Final

The sampling has been completed. This finding is not considered to be generic because there were no errors identified on any of these records. Finding F142 is an isolated case.

Resp. Org. Ed Bush 41883 Task Force Concurrence 216 4 20183

| <b>`8</b> . | Licensing  | Books: |         |       |
|-------------|------------|--------|---------|-------|
| J.          | TTCCTT INT | 14618  | MARIARA | etion |

A. Preliminary

The example identified thus far satisfied the licensing basis.

Outil-sampling is completed, a potential exists for the licensing basis not being satisfied.

B. Final

The sampling has been completed and no errors were identified. Therefore the licensing basis is satisfied.

No further action is required.

Basp. Org. Ed Bunk 4/18/83 Task Force Concurrence 2/2/83

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

Task force is not aware of any action.

B. Final

No action required since no further errors were found on the sample performed per  $4.\Delta_{\star}$ 

Resp. Org. & Burk 4 1/8/83 Task Force Concurrence 2/6-4/2-13

7A. Identification of Corrective Action for Completed Work

A. Preliminary

B. Final

Based on results of construction sample program as stated in 3.B, no corrective action for completed work is required.

Resp. Org. Ed Rune 14 1/8/83 Task Force Concurrence 2/1/2-483

| <b>.</b> . | · .            |            |    |            |        |     |           |      |
|------------|----------------|------------|----|------------|--------|-----|-----------|------|
| <b>54.</b> | Implementation | Inspection | o£ | Corrective | Astion | for | Completed | Work |

A. Preliminary

FinelNo action required.

Resp. Org. Ed B.v.kr. 1/E/83 Task Porce Concurrence 24/2483

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

Task Force is not swere of any action.

B. Finel

No action required since no further errors were found on the sample performed per 4.A.

Resp. Org. Edibush 4 118183 Task Force Concurrence 24 412483

10A. Identification of Corrective Action for Future Work

A. Preliminary

B. Final

No action required.

Resp. Org. Ed Punko 9//8/83 Task Force Concurrence 256-46-48

| •                                |                                | <del></del>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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| A. Implementation of Corrective  | Action for Peture Work         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| A. Preliminary                   |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| 3. Final                         |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| No action required.              | •                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| A. Verification of Effectivenes  |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| A. Preliminary                   |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| B. Final                         |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| No action required.              |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| <b>C O A A</b>                   |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| B. Identification and Evaluation | of Ongoing Copyestive Astice   | for Completed York                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| A. Preliminary                   | - or ordered corrective writer | iot completed work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| H/A                              |                                | •                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| R/A                              | :                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| B. Final                         |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| <b>a</b> . <b>b</b>              | 1987 Task Force Concurrence    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| 73. | Mentification of Corrective Action for Completed Work |                     |                               |          |  |  |  |  |  |  |  |
|-----|-------------------------------------------------------|---------------------|-------------------------------|----------|--|--|--|--|--|--|--|
|     | A. Preliminary                                        |                     |                               |          |  |  |  |  |  |  |  |
|     | ₩/▲                                                   |                     |                               |          |  |  |  |  |  |  |  |
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|     | 3. Final                                              |                     |                               |          |  |  |  |  |  |  |  |
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|     |                                                       |                     |                               |          |  |  |  |  |  |  |  |
| 8B. | Implementation and                                    | Inspection of Corre | ctive Action for Completed W  | ork      |  |  |  |  |  |  |  |
|     | A. Preliminary                                        |                     |                               |          |  |  |  |  |  |  |  |
|     | M/A                                                   |                     |                               |          |  |  |  |  |  |  |  |
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|     | B. Final                                              |                     |                               |          |  |  |  |  |  |  |  |
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|     |                                                       |                     |                               |          |  |  |  |  |  |  |  |
| 93. | Identification and                                    | Evaluation of Ongoi | ing Corrective Action for Fut | ire Work |  |  |  |  |  |  |  |
|     | A. Preliminary                                        |                     | •                             |          |  |  |  |  |  |  |  |
|     | H/A                                                   |                     | ,                             |          |  |  |  |  |  |  |  |
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|     | B. Final                                              |                     |                               |          |  |  |  |  |  |  |  |
|     | D. FIREL                                              |                     |                               |          |  |  |  |  |  |  |  |
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| 102. |           |          | tion of G  | )TTOCE IV | • Acti  | m for i  | Juture V | lork            |        |      |                                                                                                                                                                                                                                  |            |   |
|------|-----------|----------|------------|-----------|---------|----------|----------|-----------------|--------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---|
|      | A.        | Prelim   | inery      |           |         |          |          |                 |        |      |                                                                                                                                                                                                                                  |            |   |
|      |           | M/A      |            |           |         | -        |          |                 |        |      |                                                                                                                                                                                                                                  |            |   |
|      |           |          |            | THE       |         |          |          |                 |        |      | -                                                                                                                                                                                                                                |            |   |
|      | 1.        | Finel    |            |           | 4       |          |          |                 |        |      |                                                                                                                                                                                                                                  |            | • |
|      | -         |          |            |           |         |          | •        |                 |        |      |                                                                                                                                                                                                                                  |            |   |
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|      | les       | p. Org.  |            |           | /       | Task     | Force C  | oncurre         | DCG    |      | ,                                                                                                                                                                                                                                | , ,        |   |
|      | _         |          |            | A         |         |          |          | · * · · · · · · |        |      |                                                                                                                                                                                                                                  |            |   |
| 113. | î mp      | lemente: | tion of Co | erective  | • Acti  | on for 1 | future W | ork             |        |      |                                                                                                                                                                                                                                  |            |   |
|      | ▲.        | Prelim   | inery      |           |         |          |          |                 |        |      |                                                                                                                                                                                                                                  |            |   |
|      |           | H/A      |            |           |         |          |          | ٠               |        |      |                                                                                                                                                                                                                                  |            |   |
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|      | Б.        | Final    |            |           |         |          | X        |                 | ٠.     | <br> | en de la companya de la companya de la companya de la companya de la companya de la companya de la companya de<br>La companya de la companya de la companya de la companya de la companya de la companya de la companya de la co | :          |   |
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| 123. | Ver:      | ificatio | on of Effe | ctivene   | ss of ( | Correct  | ive Acti | on for          | Future | Work |                                                                                                                                                                                                                                  |            |   |
|      | <b>A.</b> | Prelim   | inery      |           |         |          |          |                 |        | •    |                                                                                                                                                                                                                                  |            |   |
|      |           | M/A      |            |           |         |          |          |                 |        |      |                                                                                                                                                                                                                                  |            |   |
|      |           |          |            |           |         |          |          |                 |        |      |                                                                                                                                                                                                                                  |            | • |
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|      | В.        | Final    |            |           |         |          |          |                 |        |      |                                                                                                                                                                                                                                  |            |   |
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|      | Res       | p. Org.  |            |           |         | Task     | Force C  | oncurre         | DCG .  |      | /                                                                                                                                                                                                                                | <i>! !</i> |   |

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TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R1 Date 12/22/83

- 1. Task Porce Category 14 for Watts Bar Nuclear Plant Unit 1
- Task Force Category Description and Related B&V Findings:
   Various supports on the AFW system have not been modified, redesigned, or initially designed per the revised analysis of ECM 2576: #369, #371, #756, #767, #783, #784, #788, #794, #845, #853, #855, #899, F911, #949, F950, #951, F955, #958, F963, #964, F965, and #821.
- 3. Evaluation for Cause
  - A. Preliminary

    An ineffective tracking of work progress under CEB 81-30. SWP's tracking of the status of ECN 2576 provided the inaccurate conclusion that unit 1 work was completed. No formal controls were required for ECNs which required many work items over a relatively long period of time and for which responsibility was transferred between supervisors.
  - B. Final

An ineffective tracking of work done per CEB-81-30 under ECN 2576. SWP's tracking of ECN 2576 provided the inaccurate conclusion that all hanger work for unit 1 was complete. There were no formal controls to track the many work items done over a relatively long period of time and for which responsibility was transferred between supervisors during the SWP reorganization.

Resp. Org. MOof 1/3/84 Task Force Concurrence

28/\_\_15184

- 4. Evaluation for Generic Examples
  - A. Preliminary

Since all unit I hangers were covered by ECN 2576, a complete review of work under ECN 2576 is needed to identify generic examples in rigorous analysis. A sample of one relatively large ECN outside the scope of AFW should be conducted to confirm the scope of that ECN was implemented.

B. Finel

Since all unit 1 hangers were covered by ECN 2576, a complete review of work done under ECN 2576 was performed. In addition ECN 3184 was reviewed to ensure that the scope of that ECN was implemented. It has been concluded per these reviews that this is a unique case and not generic to the ECN process. See attached memo to Files dated 12/14/83 (WBP 831214 001).

Resp. Org. JJ Mond 1 /3/84 Task Force Concurrence 115/84

| 5. | Licensi | no Res | is ter | isfaction |
|----|---------|--------|--------|-----------|
| •  | PTCAMAT |        | 18 365 | LSISCEION |

A. Preliminary

In some examples hangers did not get revised, resulting in the licensing basis not being satisfied.

B. Final Hanger discrepancies identified by Black & Veatch were not incorporated on numerous hanger drawings per ECH 2576, resulting in the licensing basis not being satisfied. These discrepancies have been handled under ECH 3511 to satisfy the licensing basis for AFW. All discrepancies found per the review made in step 4.8 will be completed under ECH 4080 by 12/30/83 to satisfy the licensing basis for

Resp. Org. 1 7006 1 /3/84 Task Force Concurrence

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

WBH SWP 8301 and ECN 3511 have been initiated. They are limited in scope to the B&V findings on the auxiliary feedwater system and do not yet prescribe a corrective action.

B. Final

HCR WBHSWP8301 was written against B&V findings on the sumiliary feedwater system. All changes required on sumiliary feedwater supports have been made under ECH 3511. All systems have been reviewed for implementation of ECH 2576 and ECH 3184. Any discrepancies found per this review will be resolved under ECH 4080.

Resp. Org JA Mod 1/3/84 Task Force Concurrence 15/84

7A. Identification of Corrective Action for Completed Work

A. Preliminary

Need to complete ECN 2576 for all systems.

B. Final

All discrepancies found per the review of all systems for ECH 2576 and ECH 3184 will be completed per the disposition of MCR WBNSWP8301 under ECH 4080 by 12/30/83.

Basp. Org. 900 1 13/84 Task Force Concurrence

| 84. | Implementation    | and | Inexection | ~6  | Correction | Accies  |     | Complessed | Uaab  |
|-----|-------------------|-----|------------|-----|------------|---------|-----|------------|-------|
| -   | The second second | -   |            | O.F | LOTTECTION | ACT 100 | TOP |            | HOTE. |

A. Preliminary

#### B. Final

Any remaining work required under ECN 4080 will be tracked per the dispostion of MCR WEMSWF6301 under CTR WEM E-361.

Resp. Org. 9700 13/84 Task Force Concurrence 1/5784

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

Task force is not aware of any action.

B. Finel

See Step 10A.B.

Resp. Org. J Mook 1/3/84 Task Force Concurrence 1/5/84

10A. Identification of Corrective Action for Puture Work

A. Preliminary

Criteria need to be established for the identification of need for employment of tracking systems, as well as for implementing them. This criteria should be linked to the establishment of SEPs.

B. Final

all future ECMs on WBP will be written for a single unit only, therefore, eliminating much of the problem that occurred with ECM 2576. To prevent recurrence the review of analysis isometrics and load tables per the scope of the ECM have been upgraded to formal calculation packages requiring appropriate documentation. This upgrading and documentation per the scope of the ECM are requirements that have been incorporated into WBP-EP 43.14.

Rasp. Org. J. 13/84 Task Force Concurrence 2/6 /15/84

| 14. | i.         | lementation                 | of Correc                             | tive Acti              | ion for I | Tuture Wor                         | k                               |             |             |
|-----|------------|-----------------------------|---------------------------------------|------------------------|-----------|------------------------------------|---------------------------------|-------------|-------------|
|     | <b>A</b> . | Proliminary                 |                                       |                        |           |                                    |                                 |             | ,           |
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|     |            | ,                           |                                       |                        |           |                                    |                                 |             |             |
|     |            |                             |                                       |                        |           |                                    |                                 |             |             |
|     | B.         | Final All future            | <b>eva</b> luatio                     | ns of ans              | lysis is  | ometrics :                         | and load table                  | s. revised  | DOT         |
|     |            | reenalysis,<br>WEP-EP 43.14 | will be<br>4 issued                   | performed<br>8-22-83 ( | ESB 8304  | t <del>andard</del> e<br>122 202). | ralustion shee<br>This evaluati | ts in acco  | rdence wit  |
|     |            | ensure that                 | no suppo                              | rt revisi              | STE REG.  | over looke                         | i. Each evalu                   | stice peck  | see will b  |
|     |            |                             |                                       |                        |           |                                    |                                 |             |             |
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|     |            | Preliminary                 | me page                               | ecion or               | ongoing   | COLLECTIA                          | Action for C                    | ompleted We | ork         |
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| 83. Implementation as | nd Inspection of Corrective Action for Completed Work      |
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| 9B. Identification an | nd Evaluation of Ongoing Corrective Action for Future Work |
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# Memorandum

TENNESSEE VALLEY AUTHORITY WBP '83 1214 001

: WBP Files

FROM : R. L. Ilich, 375 GB-K

DATE : DEC 1 4 1983

SUBJECT: WATTS BAR NUCLEAR PLANT UNIT 1 - DOCUMENTATION SUMMARY FOR BLACK AND VEATCH

TASK FORCE CATEGORY 14 COMMITMENT ASSOCIATED WITH NCR WBMSWP8301

#### Synopsis

The Watts Bar Design mechanical group commitment to review ECN 2576 and one other relatively large ECN for Black and Veatch Task Force Category 14 is complete. The following detailed summary presents the overall results of this review. The summary will show that 92 percent of approximately 5,000 suports reviewed for ECN 2576 were found to require no change. Of the remaining eight percent, one-tenth percent required construction rework and the remaining seven and nine-tenths percent required only documentation changes. The summary will also show that 99 and nine-tenths percent of approximately 435 supports reviewed for ECN 3184 were found to require no change. The remaining one-tenth of a percent required minor construction rework such as adding a shim plate to improve the bearing surface for the pipe lug.

We feel that the review for ECN 3184 shows that the ECN was implemented correctly and the oversights found in the review for ECN 2576 were not generic.

#### Summary

The following summary has been prepared as a followup to our commitment to the Black and Veatch Task Force to perform a complete review of the work under ECN 2576 and one relatively large ECN outside the scope of the auxiliary feedwater system. The ECN chosen for the additional review was ECN 3184. This ECN required the review of all axial pipe supports with lugs bearing against structural tube steel due to the lack of consideration given for the radiused corners on the tube steel. This problem has the potential of overstressing the pipe wall and allowing more axial movement than the piping analysis allows.

The approach taken for ECN 2576-was to review all unit 1 rigorously analyzed support designs (approximately 5,000) against the current analysis and identify all discrepancies. For ECN 3184, all unit 1 axial support designs with lugs bearing against structural tube steel (approximately 435) were reviewed to determine if any overstressed conditions existed or if any axial movement was allowed which exceeded the piping analysis requirements.

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WATTS BAR MUCLEAR PLANT UNIT 1 - DOCUMENTATION SUMMARY FOR BLACK AND VEATCE TASK FORCE CATEGORY 14 COMMITMENT ASSOCIATED WITH NCR WENSWP8301

The review for EUNs 2576 and 3184 involved reviewing approximately 5,500 supports from both rigorously and alternately analyzed piping Systems. The results for both ECNs are as follows:

# ECN 2576

Of approximately 5,000 unit 1 supports reviewed against the scope of ECN 2576, 382 supports were found to require minor documentation changes and only six supports were found to require construction rework to meet the requirements of the latest analysis. The documentation changes were of a minor nature such as a location correction, a node point correction or a support type changed from a unidirectional to a rigid support which only affected the support drawing. The problems encountered with the six supports requiring construction rework are considered insignificant with respect to their effect on piping stresses and would not have caused the pipe to fail. These supports and their deficiencies are described in attachment No. 1.

# ECN 3184

Of approximately 435 unit 1 supports considered in the scope of ECN 3184, one support was found to require construction rework. The change required will be of a minor nature such as adding a shim rate to improve the bearing area for a lug bearing against structural tube steel. The problems encountered with the one support found is also described in attachment No. 1.

The review for ECN 2576 was carried out in accordance with the method described in WBP-EP 43.14, section 3.3.1, and the detailed results were checked and microfilmed. In addition, the results of the review for ECN 3184 were checked and microfilmed. A list of MEDS accession numbers for these reviews can be found in attachment No. 2. All suports identified to be deficient per ECN 2576 and 3184 will be corrected under ECN 4080.

To prevent recurrence of the problems encountered in implementing ECN 2576, Watts Bar mechanical group has revised EN DES-EP 43.14 to establish a method for reviewing and documenting changes to supports per revised analysis (figure 21, EN DES-EP 43.14). This review will identify all work required on pipe supports and provide a comprehensive list of support drawings to be identified on the ECN data sheet.

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WATTS BAR NUCLEAR PLANT UNIT 1 - DOCUMENTATION SUMMARY FOR BLACK AND VEATCH TASK FORCE CATEGORY 14 COMMITMENT ASSOCIATED WITH NCR UBHSWP8301

### Conclusions

The reviews which have been done for ECRs 2576 and 3184 have shown that the implementation of ECNs in Watts Bar Mechanical Design Project are carried out with a high level of confidence that the scope of ECNs are correctly implemented on EN DES drawings. Although ECM 2576 revealed eight percent of the supports reviewed would require changes only one-tenth of a percent required any construction rework. ECN 2576 is considered unique in the fact that thousands of drawings were involved, and the designs were done over a long duration. These drawings were controlled by many supervisors and the analysis scoping procedure as now required by EM DES-EP 43.14 was not in effect, leading to inadequate scoping of the ECN. Our review for ECN 3184 revealed that only one pipe support which was marginally overstressed required a change. From these results, we feel that the one-tenth percent construction rework and the seven and mine-tenths percent documentation failure rate for ECN 2576 is not generic and the processing of ECNs by Watts Bar Mechanical Design Project is done with a high level of quality control.

1) C. Standiff

R. h. Hich

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ILI:CDP

cc: J. C. Standifer, 204 GB-K

12/ /83 - JCS:CDP cc: MEDS, W5863 C-K

M. N. Sprouse, W11A9 C-K

| 2576 - 06 app page                                                                                                                                                                                                | CTS ON PIPING SYSTEM                                                                                                                                                                                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2576 26-1FP-R231 Fine Prot                                                                                                                                                                                        | •                                                                                                                                                                                                                  |
| the negative Y direction and by pipe caused by 100% in the negative Y direction and by pipe caused by 100% in positive Y dir. Support considered was not designed to restrain the stress in positive Y dir. load. | ced atress on an 8° diz. sed by a 50% load can be ed negligible. The refer n the pipe is 10,700 psi, e, a pipe failure would no urred.                                                                             |
| bused on supports.  the pipe                                                                                                                                                                                      | ced stress on the 1-1/2 e would not be significant location of adjacent. The reserve stress in is 9,900 psi, therefore, ailure would not have                                                                      |
| 1/10-inch movement in the Y movement direction with no restraint. valve. / thermal showever,                                                                                                                      | port had a 1/16-inch gap<br>in the Y direction and t.<br>of 1/10-inch is a rounde<br>Assuming no gap present t.<br>stress would be high,<br>the reserve stress is<br>si. We feel a pipe failur<br>t have occurred. |
| pipe. The existing variable load would spring used for the support would reserve a not accommodate a load less than psi, ther                                                                                     | ced atress on the 3-inch a caused by a 67-ib. pre-<br>ld not be significant. To<br>stress in the pipe is 14,2<br>refore, a pipe failure wo-<br>occurred.                                                           |

| * ,  |             | •                       | AlaCHMENT 1                                                                                                                                                                                    | •                                                                                                                                                                                                                                     |
|------|-------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ECH  | SUPPORT NO. | System                  | DESCRIPTION OF DEFICIENCY                                                                                                                                                                      | EPFECTS ON PIPING SYSTEM                                                                                                                                                                                                              |
| 2576 | 1-70-186    | Comp. Cooling           | Support is designed as a dynamic snubber and the piping is analyzed assuming a rigid restraint.                                                                                                | The pipe would be unsupported in the axal direction during normal operating conditions. The additumrestrained 590-lb. load would to picked up by adjacent supports.                                                                   |
| 2506 |             | ,                       |                                                                                                                                                                                                | The reserve stress in the 3-inch dia. line is 33,700 psi at this support and no equipment nozzles are in the vacinity of this support therefore, a pipe failure would no have occurred.                                               |
| 2576 | 70-1CC-R060 | Comp. Cooling           | Support is designed as a rigid support in the Y direction and the piping is analyzed assuming a variable spring.                                                                               | The load at the support 13 6,425 lb. in the Y direction with .06-inch movement in the +Y dir. The thermal stress would be high from restraining the pipe, however the reserve stress in 11,264 pur. We feel a pipe failure would not  |
| 3184 | 474406-8-19 | Chem. & Vol.<br>Control | Support has lugs bearing against tube steel. No consideration was given to the radius corners on the tube steel and the effects of increasing the movement arm and induced stress in the pipe. | The stress induced in the pipe exceeds the lug allowable stress of 13,867 psi by 2/10 of a percent This condition would not have caused a pipe failure. Since the pipe is being revised for other construction problems, a shir plate |
|      | ,           |                         |                                                                                                                                                                                                | will be added to lower the induced stress.                                                                                                                                                                                            |

# ATTACHMENT NO. 2

|       | · ·                                          |                                                                                      |                                                                                                                                                                                                           |  |  |  |
|-------|----------------------------------------------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| ECN   | MCH_SECTION                                  | 1" DS_NO_                                                                            |                                                                                                                                                                                                           |  |  |  |
| 2576  | 43                                           | WRP 330610 072 thru WRP 830610 101 WRP 831027 030 thru WRP 831027 045 WRP 831101 038 |                                                                                                                                                                                                           |  |  |  |
| 2576  | f4-                                          | WBP 831024 053                                                                       |                                                                                                                                                                                                           |  |  |  |
| 2576  | <b>#1</b>                                    | WBP 831107 019                                                                       |                                                                                                                                                                                                           |  |  |  |
| 2576  | #2                                           | WBP 831103 045                                                                       |                                                                                                                                                                                                           |  |  |  |
| 3184  | <b>#1</b>                                    | WBP 831107 020                                                                       |                                                                                                                                                                                                           |  |  |  |
| 3184  | #2                                           | KBP 831103 044                                                                       |                                                                                                                                                                                                           |  |  |  |
| 3184_ | /3                                           | WBP 831027 029                                                                       |                                                                                                                                                                                                           |  |  |  |
| 3184  | #4                                           | WBP 831024 054                                                                       |                                                                                                                                                                                                           |  |  |  |
|       | 2576<br>2576<br>2576<br>2576<br>3184<br>3184 | 2576                                                                                 | 2576 #4 WBP 831027 030 thru WBP 830610 101 WBP 831027 030 thru WBP 831027 045 WBP 831024 053 2576 #1 WBP 831107 019 # 2576 #2 WBP 831103 045 3184 #1 WBP 831107 020 WBP 831103 044 3184 #2 WBP 831027 029 |  |  |  |

TVA Tack Force for Review of Black & Vestch Findings

EVALUATION SHEET

Date 11/1/83

- 1. Task Force Category 18 for Watts Bar Muclear Plant Unit 1
- 2. Task Force Category Description and Related B&V Findings:

A technical note on a piping support drawing (47A050-17 note #3) was found to be invalid for some applications: 1761

- 3. Evaluation for Cause
  - A. Preliminary

Drawing was not adequately checked and no calculations were performed to verify the adequacy of the technical note on the pipe support drawing.

B. Final The note was issued with the intention that its application is good for selfdrilling anchor bolts only (the maximum diameter is 7/8 inch). The designer and checker did not anticipate any other types of bolt sizes larger than 7/8inch dismeter that will be used in pipe supports. Later, different type bolts (and thus larger bolts) were used but the note was not revised.

Resp. Org. R. D. Prett 4/15/83 Task Force Concurrence When NV-183

- 4. Evaluation for Generic Examples
  - A. Preliminary

- Find all examples where a 1-1/4" or larger wedge bolt was omitted because of note 3 on drawing 47A050-1T.

- This finding indicates that deviations could exist for technical notes on other typical support drawing series. A sample program for 10% of the technical notes to verify their validity and existence of calculations will determine if other exemples generic to this finding exist.

B. Final EN DES has identified 10 systems of which there are supports that have 1-1/4" diameter wedge bolts. We will review these supports and will continue our evaluation to determine if there are other supports (with another type of bolts which sizes are larger than 7/8" diameter) that are a potential candidate for the note. EM DES will send these drawings to COMST for verification (if the note is applicable). EN DES has completed the evaluation of all typical supports and general sotes and found all to be adequate (WBP 830914 230).

Resp. Org. (10/24/83 Task Force Concurrence ////0/83

### 5. Licensing Basis Satisfaction

#### A. Preliminary

Licensing basis impact cannot be determined until all examples of deviations are identified and evaluated.

#### B. Finel

Sens-as-5.4. As a result of the review in step 4 of other typical notes and the results of step 8A review for applications of the deficient note, the licensing basis is met.

Resp. Org. R. A. Hatt 4//5/83 Task Force Concurrence 2/1/6/83

# 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

#### A. Preliminary

No corrective action identified by the task force.

B. Final
EN DES has completed its evaluation of all 10 systems and has determined that
there are 22 supports with 1-1/4" \$\text{g}\$ wedge bolts or 1" \$\text{g}\$ grouted anchors that
could be adverse conditions if the note was applied. EN DES has sent the list
of supports to COMST requesting them to verify whether the note has been used.
If the note was used, COMST will provide the exact weld length and size. This
data will be used to determine the adequacy of the installation. Redesign and
reconstruction will be performed as necessary. These plans are adequate.

Rasp. Org. 1. 1. 1. 183

# 7A. Identification of Corrective Action for Completed Work

# A. Preliminary

Analyze the adequacy of all generic examples identified under 4A and design and/or reconstruct as necessary.

B. Final
EN DES will evaluate CONST's findings. If the note has been applied, EN DES
will perform the necessary calculations to determine the adequacy of the
substituted welds. If the note has not been used, the support is satisfactory.
Since no other notes of this nature were found to be deficient in step 4, no
further corrective action is required.

Basp. Org. R. A. Pratt 1114183 Task Force Concurrence 24/11/0/83

SA. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final COMST has completed its inspection of all supports identified by EM DES (see WEP 830429 032 and WEW 830523 005). Of the 22 supports identified to COMST, the substitution of welds for enchor bolts was made on 5 supports. Review of the detailed calculations for these supports determined the installations are adequate.

Basp. Org. R.D. Pratt 716183 Task Force Concurrence W. Mol83

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

Mone identified by the task force.

B. Final - Following actions have been taken to alleviate these conditions: (1) EN DES has stopped the use of this note for bolts 1" \$\textit{\textit{g}}\$ and larger and the drawing note will be revised to limit the applicability of the note; (2) EN DES has issued a construction specification that provides requirements for locating attachments on any embedded plate. This specification (H3C-928) will require a detailed review of connections of this nature.

Resp. Org. R.D. Patt 11/4/83 Task Force Concurrence When 11/10/8.

10A. Identification of Corrective Action for Future Work

A. Preliminary

- Nevise EN DES EP-3.03 to clarify requirements and applicability of calculations for technical notes on design drawings.

- Train all SWP personnel involved in the design and checking of support drawings in the requirements of EN DES EPs 3.03 and 4.25.

B. Final

The plan in 9.A.B is adequate.

Resp. Org. R.A. Rett 573/83 Task Force Concurrence W/ 1114/83

|    | . Implementation of Corrective Action for Puture Work  A. Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                     |
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|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                     |
|    | B. Final - Drawing 47A050-IT, note 3 was revised as follows (revision 2): a surface mounted base plate with anchor bolts 7/8" diameter or less or embedded plate, and that one or more of the anchors cannot be installed<br>anchor bolts in the way of the embedded plate may be emitted if at last<br>5/16" fillet weld between the surface mounted base plate and the embed-<br>is provided for each emitted anchor bolt. The weld must come to or ex-<br>least one centerline of the emitted bolt and meet requirement of speci-<br>H3C-928 and G32. This note applies to WB, SSD, SPD and GROUTED Bolts of | verlaps of<br>d, the<br>st 2" of<br>led plate<br>ses at<br>fication |
|    | Resp. Org. R. A. Rett 6/29/83 Task Force Concurrence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <u> 1963</u>                                                        |
| ٨. | Verification of Effectiveness of Corrective Action for Future Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                     |
|    | A. Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                     |
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|    | Resp. Org Task Force Concurrence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                     |
| В. | Identification and Evaluation of Ongoing Corrective Action for Completed Wo                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | rk                                                                  |
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| 10B. | <u>L</u> de    | Identification of Corrective Action for Future Work |                                                    |   |  |  |  |
|------|----------------|-----------------------------------------------------|----------------------------------------------------|---|--|--|--|
|      | A. Preliminary |                                                     |                                                    |   |  |  |  |
|      |                | W/A                                                 | ŧ                                                  |   |  |  |  |
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|      | 3.             | Finel                                               |                                                    |   |  |  |  |
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|      | Res            | p. Org                                              |                                                    |   |  |  |  |
| 113. | Imp :          | lementation                                         | of Corrective Action for Future Work               |   |  |  |  |
|      | ٨.             | Preliminary                                         |                                                    |   |  |  |  |
|      |                | W/A                                                 |                                                    |   |  |  |  |
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|      | Res            | p. Org                                              | / / Task Force Concurrence                         |   |  |  |  |
| 12B. | Ver:           | ification of                                        | Effectiveness of Corrective Action for Future Work |   |  |  |  |
|      | A.             | Preliminary                                         |                                                    |   |  |  |  |
|      |                | H/A                                                 |                                                    | • |  |  |  |
|      |                |                                                     |                                                    |   |  |  |  |
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|      | Res            | p. Org                                              | / / Task Force Concurrence                         |   |  |  |  |

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R2 Date 2/21/84

- 1. Task Force Category 19 for Matts Bar Muclear Plant Unit 1
- 2. Task Force Category Description and Related B&V Findings:

Equipment cannot be determined to be environmentally qualified to NUREC-0588: 7140 and 7144.

- 3. Evaluation for Cause
  - A. Preliminary

The design control process failed to recognize the need to systematically environmentally qualify equipment for postulated accidents.

B. Final

The design control process failed to recognise the need to systematically environmentally qualify equipment for postulated accidents.

Resp. Org. MR Referr6/2/83 Task Force Concurrence 26 6 16 183

- 4. Evaluation for Generic Examples
  - A. Preliminary

The very nature of the findings does not lend itself to a sample approach for bounding the problem to the AFW system. The EN DES equipment qualification program under NUREG-0588 prescribes an adequate approach to identify generic examples for WBM Unit 1.

B. Final

The very nature of the findings does not lend itself to a sample approach for bounding the problem to the AFW system. The EN DES equipment qualification program under HUREG-0588 prescribes an adequate approach to identify generic examples for WBH Unit 1.

Basp. Org. MR Below 6/2/83 Task Force Concurrence War 6/6/83

# 5. Licensing Basis Satisfaction

A. Preliminary

Lack of environmental qualifications for safety related equipment does not satisfy the licensing basis. Some currently known examples have been identified where the equipment was not qualified.

B. Final

Lack of environmental qualifications for safety related equipment does not satisfy the licensing basis. Some currently known examples have been identified where the equipment was not qualified.

Resp. Org. MRB. eleur 6/3/83 Task Force Concurrence

- 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work
  - A. Preliminary

EN DES has developed and implemented a comprehensive program to determine environmental qualifications of equipment and correct as necessary, including the documenting of all identified deficiencies via the MCR process. This is an acceptable approach.

B. Final

EW DES has developed and implemented a comprehensive program to determine environmental qualifications of equipment and correct as necessary, including the documenting of all identified deficiencies via the NCR process. This is an acceptable approach.

Resp. Org. MR Below 6/3/83 Task Force Concurrence 2/6/83

- 7A. Identification of Corrective Action for Completed Work
  - A. Preliminary

The EM DES environmental qualification program includes appropriate corrective action to verify qualifications or require replacement of previously procured and installed equipment.

B. Final

The EM DES environmental qualification program includes appropriate corrective action to verify qualifications or require replacement of previously procured and installed equipment.

Resp. Org. MRB eleur 6/3/83 Task Force Concurrence 6/6/83

- SA. Implementation and Inspection of Corrective Action for Completed Work
  - A. Preliminary
  - B. Finel

Our engineering procedures and our NUESC 0588 program are adequate to assure proper handling of systems important to safety.

Resp. Org. MR Relucte/3/83 Task Force Concurrence

He 7 124/53

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

The Task Force is not sware of any action.

B. Finel

Presently there is no identified program to ensure implementation of corrective action for future work. However, a nonconformance report GENGER \$204 has been written on this problem. The Muclear Engineering Branch is to resolve this nonconformance report.

Resp. Org. MRR. Lun 6/3/83 Task Force Concurrence

Who 616183

10A. Identification of Corrective Action for Future Work

A. Preliminary

IN DES needs to revise the design control process to provide environmental qualification of equipment.

B. Final - Our NUREG 0588 program presently provides an adequate identification of environmental qualification requirements for future work. In addition, EP 3.01 has been revised to reference environmental drawings. The Watts Bar design criteria has also been revised. EEB has reviewed the attached "Equipment Qualification Program" and has found it adequate for "corrective action" for NCR GENQAB 8204. The need for an interdivisional procedure has been identified in the "Equipment Qualification Program" and this need has been coordinated with OQA.

Resp. Org. MR Colum 1/21/84 Task Force Concurrence 2 2 2 /84

| A. Employentation of Co. A. Preliminary | aertaa werton                           | rat second m  | TT.       |           |                |      |
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| B. Final                                |                                         |               |           |           |                |      |
| See item 10A.                           |                                         | •             |           |           |                |      |
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| Resp. Org. MABAL                        | ~ 2/22/84                               | Task Force Co | DESTINA   | 211       | Z_#3           | 84   |
|                                         | <del></del>                             |               |           |           |                |      |
| L. Verification of Effec                | tiveness of Cor                         | rective Actio | n for Fut | are Work  |                |      |
| A. Preliminary                          |                                         |               |           |           |                | · ·. |
|                                         |                                         |               |           |           |                |      |
|                                         |                                         |               |           |           |                |      |
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| B. Final                                | in .                                    |               |           |           | and the second |      |
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|                                         | <del></del>                             | Task force Co | Mentrence |           |                |      |
| B. Identification and Ev                | aluation of Ong                         | oing Correcti | ve Action | for Compl | eted Work      |      |
| A. Preliminary                          |                                         | • .           |           |           |                |      |
| M/A                                     | * * *                                   |               | ٠.        |           |                |      |
|                                         |                                         |               |           |           |                |      |
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| B. Final                                |                                         |               |           |           |                |      |
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|----------|-----------|------------------------|--------------------|---------------|--------------|------------------|-----|
| 73.      | Ide       | entification of Correc | ti <b>ve Ac</b> ti | m for Comple  | ted Work     |                  |     |
|          |           | Preliminary            |                    |               |              |                  |     |
|          | <b>~</b>  | •                      |                    |               | •            |                  |     |
|          |           | W/A                    |                    |               |              |                  |     |
|          |           |                        |                    |               |              |                  |     |
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|          | 3.        | Finel                  |                    |               |              |                  |     |
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| 55.      |           | lementation and Inspe  | ction of (         | brrective Ac  | tion for Com | pleted Work      |     |
|          | <b>A.</b> | Preliminary            |                    |               |              |                  |     |
|          |           | H/A                    |                    |               |              |                  | ,   |
|          |           | ,                      | -                  |               |              | •                |     |
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|          |           |                        |                    | <u>.</u>      | <del></del>  |                  |     |
| 9B.      | Ide       | ntification and Evalu  | ation of (         | ingoing Corre | ctive Action | for Future World | k   |
|          | A.        | Preliminary            |                    |               |              |                  |     |
|          |           | N/A                    |                    | ,             |              |                  |     |
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| OB. Ide   | ntification         | of Correct | ive Action | tor Pa      | ture Vork   | 1          |                |     |          |
|-----------|---------------------|------------|------------|-------------|-------------|------------|----------------|-----|----------|
| <b>A.</b> | Preliminary         | •          |            | •           |             |            |                |     |          |
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|           | dementation         |            | ive Action | for Fu      | ture Work   |            |                | **  |          |
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| R. Veri   | ification of        | Tilontina  |            |             |             |            |                |     |          |
|           | Preliminary         |            | mess of co | LIGCTIA     | . ACTION    | tor future | WOTK           | •   |          |
|           | M/A                 | . `        |            |             |             |            | •              |     |          |
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### EQUIPMENT QUALIFICATION PROGRAM

The need for a comprehensive program to concisely direct and control all activities associated with establishing and maintaining the required level of environmental and functional qualification of safety-related components has become more evident as the work required by IEB79-01B and NUREG-0588 has progressed.

The evaluation work in progress or completed to date has been conducted in compliance with existing procedures that govern specific activities, such as design calculations; however, there has been an absence of an integrated approach to control and insure that the required qualification level of each component is maintained throughout the life of the plant. The proposed programmatic approach to resolve the concerns is depicted by the attached informational flow charts developed to address:

- The completed, current and future activities related to IEB79-01B, NUREG-0558, and 10CFR50.49,
- Any new system that may be added to a plant environmental some or acces.
- The procurement of any safety-related component by EN DES or NUC PR and.
- The installation and maintenance requirements and activities on a component specific basis.

Currently there are 18 Engineering Procedures that govern specific activities associated with equipment qualification. For the proposed program 3 of these will need revision and 7 others need to be developed. One of the 7 will be an interdivisional procedure and one will be an upper tier document addressing the overall program.

The attached listing of existing applicable engineering procedures are indicated on the programmatic flow charts by the number as listed.

EP-4.01 (number 10 on list) requires further consideration for revision to environmental drawings.

EP-5.14 (number 15 on list) requires revision to reflect special handling of wendors qualification test reports.

EP-5.43 (number 18 on list) requires revision to include special handling of qualified items in both vendor shops (waiver approval limitations) and receipt handling at the site.

The detailed review of this proposed program may necessitate some changes to the flow charts and the procedure consideration as now envisioned and these will be incorporated as each need is identified.

The proposed schedule for implementing the plan is as follows:

Issue plan for review February 10, 1984

Finalise plan April 13, 1984

Final identification of required revisions
to existing procedures April 13, 1984

Final identification of new procedures needed April 13, 1984

Complete draft of new procedures and revisions
to existing procedures

June 15, 1984

Issue new procedures October 15, 1984

Implementation November 1, 1984

The above schedule was developed unilaterally and is subject to revision as the work progresses and will be dependent to a degree on priority considerations of those involved.

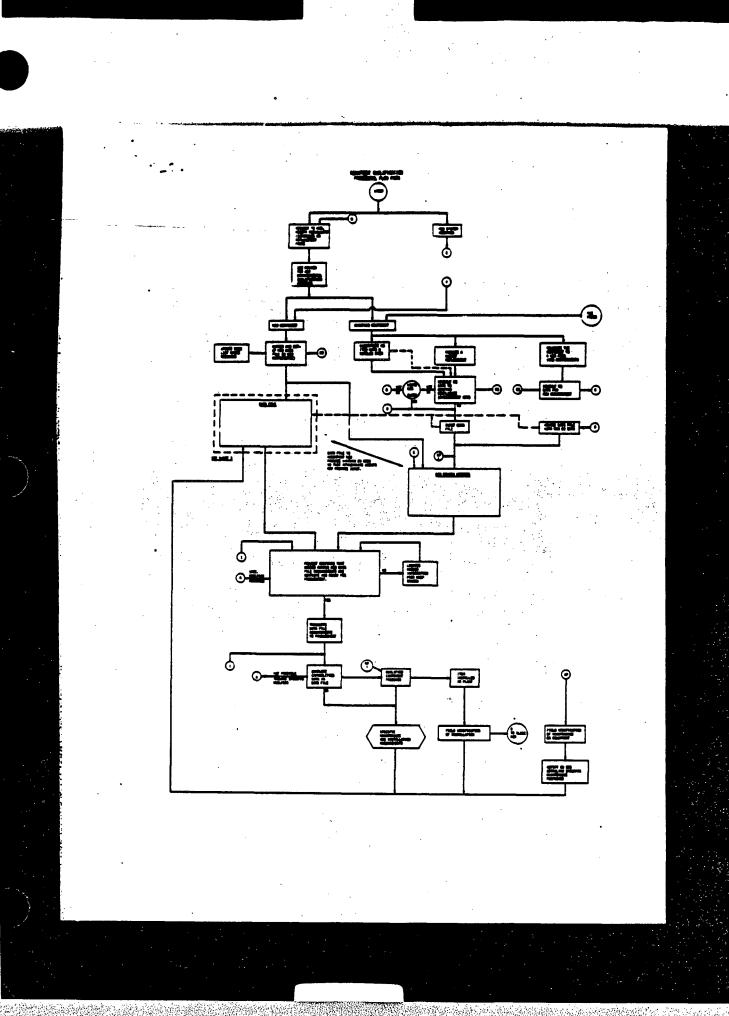
New procedures potentially required are indicated by asterisks in the blocks of the programmatic flow chart as follows:

- (\*) To cover input, use and revision of the data base
- (A\*) An interdivisional procedure to cover field varification of installation and maintenance activities for input to the data base and for closure of an MCR (if one is issued)
- (B\*) To cover review for impact on existing system components, etc., resulting from new system addition in an existing environmental some
- (C\*) To cover qualification testing
- (D\*) To cover "refined" analysis for a specific component in an existing environmental zone
- (E\*) To cover the structure of the data base
- (F\*) An upper tier procedure or document to define the overall program

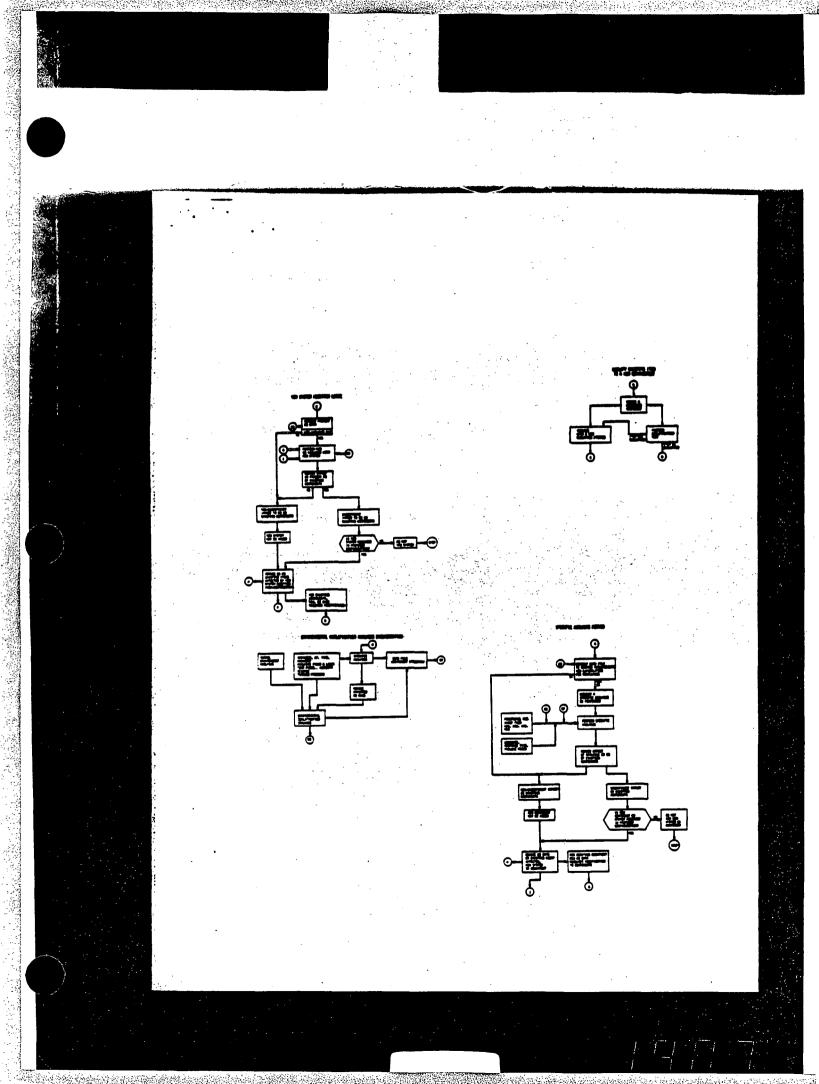
## ATTACHMENT EXISTING PROCEDURES

- 1. MCR's Reporting and Handling (EP-1.26)
- 2. Control to Documents Affecting Quality (EP-1.28)
- TVA Hemorandums Transmitting Quality Information Handling in EM DES (EP-1.50)
- Mandling of Conditions Potentially Reportable Under Title 10 CFR
  - :. Part 21, 50.36, and 50.55(e) (EP-2.02)
  - 5. Design Criteria Documents (EP-3.01)
  - 6. Seismic Design, Review and Control (EP-3.02)
- 7. Design Calculations (EP-3.03)
- Design Verification Methods and Performance of Design Verifications (EP-3.10)
- 9. QA List Preparation and Handling (EP-3.48)
- 10. Signatures/Initials for Preparation, Review, and Approval of EM DES Drawings (EP-4.01)
- 11. Engineering Change Notices (ECR's) before Licensing HandFirst (EF-4.02)
- 12. Field change Requests Initiated by NUC PR (EP-4.06)
- Design change Requests (DCR's) Processing, Reviewing, and Approving (EP-4.18)
- Engineering Change Notices (ECNs After Licensing Handling (EP-4.52)
- 15. Vendor Documents Handling and Disposition (EP-5.14)
- 16. Processing Procurement Requests (EP-5.20)
- 17. Procurement Quality Assurance (EP-5.33)
- 18. Release of QA Items from Suppliers' Shops to Construction Site (EP-5.43)

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DATA FILE THIS INFORMATION SUPPLIED BY ALL ORGANIZATIONS HOUSEKEEPING & RECONDICEPING CAPABILITIES MAINTENANCE INFORMATION

SELT.

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R2 Date 3/6/84

1. Task Force Category 20 for Watts Bar Muclear Plant - Unit 1

Task Force Category Description and Related B&V Findings:
 No procedure for documenting time delay relay settings that are determined by preoperational test and the preoperational test did not identify or regire the documenting of these settings: F113, F125, F126, F132 and F801.

3. Evaluation for Cause

A. Preliminary

The written design control process did not identify and control the time delay relay settings.

B. Final

Same as above.

Resp. Org. M. R. Relew 7/13/83 Task Force Concurrence 8 29/83

4. Evaluation for Generic Examples

A. Preliminary

This deviation applies to all systems that require time delay relay settings.

B. Final

Same as above.

Resp. Org. M. R. Belew 7/13/83 Task Force Concurrence 8 127/83

- 5. Licensing Basis Satisfaction
  - A. Preliminary

The licensing basis for these time delay relays was not satisfied.

B. Final

The licensing commitment was not met, but the effect on the licensing basis is indeterminate because the pre-op test was not run without the settings documented.

M R Below 3/6/87

Resp. Org. M. R. Below 7/13/83

G X /beg an 8/29/93

Task Force Concurrence 2/6... 8 12/83

- 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work
  - A. Preliminary

The MCR WEMERS 8301 has been written to identify the Black & Veatch finding, however no corrective action has been identified.

B. Final .

The preoperational tests are being updated to include the setting and recording of the time delay relay settings. Special Engineering Procedure EN DES SEP 83-11 is being written to have the time delay settings put on the drawings. Interim memo (EES 830614 939) was written to document the relay settings.

Resp. Org. H. R. Belew 7/13/83 Task Force Concurrence 2/12/83

- 7A. Identification of Corrective Action for Completed Work
  - A. Preliminary

The corrective action identified under item 10A should be backfitted for all time delay relays.

B. Final

Same as above.

Resp. Org. M. R. Belew 7/13/83 Task Force Concurrence 2/8/27/83

- SA. Implementation and Inspection of Corrective Action for Completed Work
  - A. Preliminary
  - B. Final. All time delay settings determined by preoperative test prior to issuance of interim memorandum (EEB 830614 939) were adequately documented. Same-as-above Preop test TVA-22 scoping document has been changed (see Continuation Sheet)

(see Continuation Sheet)

## A Balow - Mry 83

Resp. Org. H. R. Belew 7/13/83 Ta

Org. 1070-0 8-25-83

Task Force Concurrence

- 9A. Identification and Evaluation of Ongoing Corrective Action for Future Work
  - A. Preliminary

The task force is not sware of any action.

B. Fina!

Special Engineering Procedure EN DES SEP 83-11 is being written to include the delay relay settings in the preoperational tests.

Resp. Org. H. R. Belew 7/13/83 Task Porce Concurrence 2 8 E7/83

- 10A. Identification of Corrective Action for Future Work
  - A. Preliminary

EN DES should establish control of time delay relay settings within the design control process.

B. Final

Special Engineering Procedure EN DES SEP 83-11 will provide adequate control to assure proper documentation of the time delay relay setting.

Resp. Org. H. R. Belew 7/13/83 Task Porce Concurrence 2 8 20/83

| ı ia. | A. Prelimines  | n of Corrective<br>Ty | Action fo      | r Future Wor                            | k          |           |        |    |
|-------|----------------|-----------------------|----------------|-----------------------------------------|------------|-----------|--------|----|
|       |                |                       |                | •                                       |            |           |        |    |
|       | B. Final       |                       |                | •                                       |            |           | *      |    |
|       | EN DES-SEP     | 83-11 (EEE 83)        | 1014 937) 1    | has been issu                           | æd.        |           |        |    |
|       |                |                       |                |                                         |            |           |        |    |
|       | Resp. Org. 97  | RBelow 111            | <u>•/83</u> te | sk Force Com                            | turrence 2 | /         | 111101 | 83 |
| 124.  | Verification o | of Effectivenes       | e of Corre     | ctive Action                            | for Future | iork      |        |    |
|       | A. Preliminar  | <b>'y</b>             |                |                                         |            |           |        |    |
|       | B. Final       |                       |                |                                         |            |           |        |    |
|       | Resp. Org.     |                       | Ta             | sk Force Conc                           | urreace    |           | 11     |    |
| 6B.   | Identification | and Evaluation        | a of Ongoi     | ng Corrective                           | Action for | Completed | Work   |    |
|       | A. Preliminar  |                       |                | * * * * * * * * * * * * * * * * * * * * |            |           |        |    |
|       | 2              |                       |                | • • • • • • • • • • • • • • • • • • •   |            |           |        |    |
|       | B. Final       |                       | •              |                                         |            |           |        |    |
|       |                |                       |                |                                         | rurrence   |           |        |    |

| 78. Identificat            | tion of Corrective Action for Completed Work               | <del></del> |
|----------------------------|------------------------------------------------------------|-------------|
| A. Prelimi                 |                                                            |             |
| H/A                        |                                                            |             |
| 3. Finel                   |                                                            |             |
|                            |                                                            |             |
| Resp. Org.                 |                                                            |             |
| 33. Implementat A. Prelimi | ion and Inspection of Corrective Action for Completed Work |             |
| W/A                        |                                                            |             |
| 3. Pinel                   |                                                            |             |
| Resp. Org.                 |                                                            | / /         |
| 9B. Identificat A. Prelimi | ion and Evaluation of Ongoing Corrective Action for Future | Work        |
| B. Final                   |                                                            |             |
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| 108. | Identification of Corrective Action for Future Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |    |
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|      | Resp. Org. / / Task Force Concurrence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 11 |
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|      | Implementation of Corrective Action for Puture Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |    |
|      | A. Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |    |
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|      | 3. Pinel                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |    |
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|      | Rasp. Org. / / Task Force Concurrence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 11 |
| 128. | Verification of Effectiveness of Corrective Action for Future Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |    |
|      | A. Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |    |
|      | W/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |    |
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|      | 3. Final                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |    |
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TVA Task Force for Review of Black & Vestch Findings

BLACK & VEATCH EVALUATION SHEET (Continuation Sheet)

## 8A. B. Final (continued)

(NEB 821130 276) and SEP 83-11 has been issued to require documentation of all TD settings determined after June 14, 1983. These settings will be reviewed by EN DES after TVA-22 is rerun. This corrective action is not completed but will be tracked by the preop program and EN DES-SEP 83-11 through completion.

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R1 Dete <u>\$/25/83</u>

- 1. Task Force Category 23 for Watte Ber Nuclear Plant Unit 1
- 2. Task Force Category Description and Related B&V Findings: Auxiliary feedpump turbine trip and throttle valve PCV-1-51 is not included in the active valve list. The design of the valve schematic does not include the required control room bypass and test indication, nor automatic bypass of the "open" torque switch: F128, F133.
- 3. Evaluation for Cause
  - A. Preliminary

Lack of control during the determination of safety-related equipment. This process did not employ design verification.

B. Final

The failure to include the sumiliary feedwater turbine trip and throttle valve PCV-1-51 on the active valve list was an isolated error. This list was prepared in 1974 using specific selection criteria. Also, the list was reviewed within EW DES and comments were resolved through the squadchecking process. After resolution of all comments, the list was issued by memorandum. The subject valve was initially on the list but was removed during the review process due to an error in evaluating the functions of the valve.

Resp. Org. OTClift 9/1/183 Task Porce Concurrence 21/193

- 4. Evaluation for Generic Examples
  - A. Preliminary

The identified cause does not lend itself to a sample approach for bounding the problem to AFW. A review of the FSAR active valve list needs to be performed to verify it includes all appropriate components.

B. Final

This is not a generic problem associated with the valve list as shown by the evaluation in item 3. The FSAR active valve list will be reviewed and updated as required during the FSAR review process described in the task force category 4.

Resp. Org. 1764 91/183 Task Force Concurrence 2/62-91/183

# 5. Licensing Basis Satisfaction

## A. Preliminary

Licensing basis is not satisfied because required configuration for safety related related valve was not identified and implemented.

### B. Finel

Since corrective action will be taken to modify valve FCV-1-51, the licensing basis for the plant has been satisfied.

Resp. Org. DTCloff 91/183 Task Force Concurrence 2/6-71/18-3

## 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

### A. Preliminary

The task force is not swere of any action.

## B. Final

No additional corrective action is required, but the FSAR will be reviewed and revised as described in item 4 above.

Resp. Org. 107 Class 91/183 Task Force Concurrence 2/1/183

# 7A. Identification of Corrective Action for Completed Work

## A. Preliminary

HEB needs to revise the FSAR active valve list. Satisfaction of IE Circular 81-13 needs to be accomplished for any other examples identified under 4A.

# B. Finel

The FSAR active valve list will be reviewed per item 4 above. If additional discrepancies are identified, the required modifications will be identified for corrective action. Valve FCV-1-51 will be modified per the Black and Veatch finding as identified in WBN BCN 3642.

Resp. Org. DTeleft 91/183 Task Force Concurrence 21/183

| _  |                |                |               | *             |              |
|----|----------------|----------------|---------------|---------------|--------------|
| M. | Implementation | and Inspection | of Corrective | Astion for Co | maleted Hork |

A. Preliminary

## B. Finel

WMM BCH-3642 has been issued to implement corrective action on valve FCV-1-51 which was identified during the Black and Veatch review. Any additional discrepancies identified during the review per item 4 will be documented and handled in a similar manner.

Resp. Org. OTCliff 91/183 Task Force Concurrence 21/183

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

The task force could not identify any action in place to correct.

B. Final

No additional corrective action is required based on the information provided in items 3, 4, and 5.

Resp. Org. Willes 91/18 Task Force Concurrence 25 71/183

10A. Identification of Corrective Action for Future Work

A. Preliminary

The responses to IE Bulletins, Circulars, and Notices need to be based upon current controlled lists.

B. Finel

Each IE bulletin, circular, or notice should be evaluated upon receipt to determine the most appropriate method for evaluation. In regard to the active valve list, this list will be reviewed and updated if required per item 4 and will be maintained in the future as the plant design changes; therefore, this specific list will be a current controlled list. IE bulletins, circulars, and notices are handled within EM DES by EP 2.10 and are identified on the TROI systems for tracking purposes.

Resp. Org. D. T. Clift 4/19/63 Task Force Concurrence 2/6 91/183

| ٨.     | plementation<br>Proliminary |             |              |           |            |                       |             |            |
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| 1.     | Finel                       |             |              |           |            |                       |             |            |
|        | Implementing within EW D    | ES (such as | MCRs, E      | CH, and e | te.) Item  | l be hand<br>10 addre | led by issu | e list wil |
| bee    | p. 0eg. <u>07</u>           | Chy 9       | W <b>8</b> 3 | Task Fo   | rce Concur | Tence 2               |             | 91/183     |
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| 3.     | Pinel                       |             |              |           |            |                       |             |            |
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| B. Ide | mtification :               | and Evaluat | ion of O     | ngoing Co | rrective A | ction for             | Completed   | Vork       |
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| 3.     | Finel                       |             | •            |           | •          | •                     |             |            |
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| <del>-</del> - | l pl  |          | ion and i | Inspect | ion of   | Correc | tive Act           | ion for            | r Comple | ted Work  |      |       |
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|                | 1     | H/A      |           |         |          |        |                    |                    |          |           |      |       |
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| 78.            | Ident | tificati | ion and 1 | Evaluat | ion of   | Ongoin | g Correc           | tive A             | tion f   | er Future | Work |       |
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|      | <b>3.</b>   | Finel                                                          |    |
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|      | B           | Pinel .                                                        |    |
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| 128. | Veri        | fication of Effectiveness of Corrective Action for Future Work |    |
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|      | B. 1        | Final                                                          |    |
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TVA Task Force for Review of Black & Veatch Findings

BLACK & VEATCH EVALUATION SHEET (Continuation Sheet) TVA Task Porce for Review of Black & Vestch Findings

EVALUATION SHEET

Rev. R1 Date 9/23/83

- 1. Task Force Category 25 for Watte Ber Muclear Plant Unit 1
- Task Force Category Description and Related B&V Findings:
   Flange evaluations were omitted in some analysis calculations: F322.
- 3. Evaluation for Cause
  - A. Preliminary

Plange qualifications were not always done by calculations or other documented means. Qualification of these flanges by detailed calculations was not considered necessary.

- B. Final

  Flange qualification was deleted from one of the evaluated AFW problems. Checklists indicated those flange qualifications were required. The summary for this
  specific problem indicated that there were no flanges which required qualification.
  Analysts were searce of the need to qualify the flanges by detailed calculations.

  This type of error is largely contributed to individual error, inexperienced
  personnel, and the fact that some of the initial analyses was conducted prior to
  the quality control that is presently utilized.

  Resp. Org. Analysis April 19 Column Task Force Concurrence
- 4. Evaluation for Generic Examples
  - A. Preliminary

Flange qualification needs to be reviewed for all rigorous analysis problems for true 1

B. Final

Flange qualification is presently being reviewed for all rigorous analyses for WBW. (Several other deletions have been identified.)

The review has been completed and nine problems have been identified for which the flanges qualification had not been documented in the analysis.

Resp. Org. The Commence 2/12/83 Task Force Concurrence 2/12/83

# 5. Licensing Basis Satisfaction

#### A. Preliminary

The licensing basis was satisfied for the two deviations identified by \$6V. Until all flanges have been evaluated and qualification determined the potential exists that the licensing basis was not satisfied.

#### B. Final

Licensing basis is satisfied thus far since the B&V finding and the corrections made to date have not identified any examples of flanges where failures could occur or stress allowables could be exceeded. Until all flanges are evaluated, as in 4.3., there exists a slight potential that the licensing basis was not satisfied.

All flanges have been evaluated and it has been determined that they are qualified. The licensing basis is satisfied.

Resp. Org. The first 1/2/63 Task Force Concurrence 9 13/83

# 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

## A. Preliminary

The current planned corrective action for WBHCEB 8222 (not yet documented) appears acceptable to identify and correct all examples at WBH 1.

#### B. Finel

The current planned corrective action for WENCEB 8222 (a 100-percent review of all WEN problems to assure proper documentation of flange qualification) appears adequate to correct all completed work at WEN.

Resp. Org. The Concerning 1/2/87 Task Force Concurrence 2/6---- 9/3/83

# 7A. Identification of Corrective Action for Completed Work

## A. Preliminary

Calculations need to be performed to qualify all the flanges in the rigorous analysis problems.

# B. Final

The plan in 6A appears adequate.

Resp. Org. The Concurrence Track Force Concurrence 7/3/83

| M. |   | lementation | Inspection | of | Corrective | Action | for | Comiered | Mack |
|----|---|-------------|------------|----|------------|--------|-----|----------|------|
|    | _ |             |            | -  | ~~~~~~~~~  |        | LWE |          |      |

A. Preliminary

# B. Finel

A 100 percent review of all problems has been completed. Hine problems were identified for which the flange qualification had not been included in the analysis package. The flanges were evaluated and determined to be qualified. With the exception of several problems which are being reanalyzed, documentation willbe unervaled by Assurat 31, 1983.

upgraded by August 31, 1983.
Resp. Org. 12/2/27 Task Force Concurrence 1/2 9 13/83

# 9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

Task force is not mere of any action.

#### B. Finel

The latest checklist precisely notifies the analyst of the requirements for the proper flange qualification and documentation. The checklist is presently identified in J. E. McCord's memorandum to CES Files (CES 821006 003) and will be incorporated into the WEM rigorous analysis handbook.

Resp. Org. Angling 9/12/53 Task Porce Concurrence 24/183

# 10A. Identification of Corrective Action for Future Work

A. Preliminary

Specify and implement criteria for demonstration of flange qualification.

B. Finel

The action identified in 9A.B appears to be adequate.

Resp. Org. The Cin. 9/2/53 Task Force Concurrence 2/2/2 913/83

| A. Preliminary  3. Final  A checklist which includes requirements for proper flange qualification and documentation has been incorporated into the WEM rigorous analysis parallel.  Resp. Org. 1/2/5/C Task Force Concurrence 7/3/53  A. Verification of Effectiveness of Corrective Action for Future Work  A. Preliminary  3. Final  B. Final  B. Final  B. Final  B. Final | la. Impl    | omentation o  | of Corrective /                | Action for Puti                                 | ere Work                              |                  |                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------|--------------------------------|-------------------------------------------------|---------------------------------------|------------------|------------------|
| A checklist which includes requirements for proper flange qualification and documentation has been incorporated into the WEM rigorous analysis games.  Resp. Org                                                                                                                                                                                                              | ۸.          | Proliminary   |                                |                                                 |                                       | , ,              |                  |
| A checklist which includes requirements for proper flange qualification and documentation has been incorporated into the WEM rigorous analysis games.  Resp. Org                                                                                                                                                                                                              |             | ;             |                                |                                                 | •                                     |                  |                  |
| A checklist which includes requirements for proper flange qualification and documentation has been incorporated into the WEM rigorous analysis games.  Resp. Org                                                                                                                                                                                                              |             |               |                                |                                                 |                                       |                  |                  |
| A checklist which includes requirements for proper flange qualification and documentation has been incorporated into the WEM rigorous analysis games.  Resp. Org                                                                                                                                                                                                              |             | Tina)         |                                |                                                 |                                       | . •              |                  |
| Resp. Org                                                                                                                                                                                                                                                                                                                                                                     |             |               |                                |                                                 | · · · · · · · · · · · · · · · · · · · |                  |                  |
| A. Verification of Effectiveness of Corrective Action for Tuture Work  A. Preliminary  B. Final  Resp. Org. // Task Force Concurrence //  B. Identification and Evaluation of Ongoing Corrective Action for Completed Work  A. Preliminary  I/A  B. Final                                                                                                                     |             | documentation | m pre pecu juc<br>mrcu rucinos | requirements                                    | tor proper to<br>the WBW rigo         | rous analysis    |                  |
| A. Verification of Effectiveness of Corrective Action for Tuture Work  A. Preliminary  B. Final  Resp. Org. // Task Force Concurrence //  B. Identification and Evaluation of Ongoing Corrective Action for Completed Work  A. Preliminary  I/A  B. Final                                                                                                                     |             |               |                                |                                                 |                                       |                  | 200              |
| A. Verification of Effectiveness of Corrective Action for Tuture Work  A. Preliminary  B. Final  Resp. Org. // Task Force Concurrence //  B. Identification and Evaluation of Ongoing Corrective Action for Completed Work  A. Preliminary  #/A  B. Final                                                                                                                     | 2000        | -             |                                |                                                 |                                       | 201              | <b>~</b> 40.45 - |
| A. Preliminary  B. Final  Resp. Org. // Task Force Concurrence ///  B. Identification and Evaluation of Ongoing Corrective Action for Completed Work  A. Preliminary  N/A  B. Final                                                                                                                                                                                           |             | 1000          |                                | Task For                                        | rce Concurrenc                        | · Mega-          | 7 /3/153         |
| Resp. Org. // Task Force Concurrence //  B. Identification and Evaluation of Ongoing Corrective Action for Completed Work  A. Preliminary  H/A  B. Final                                                                                                                                                                                                                      | A. Veri     | fication of   | Effectiveness                  | of Corrective                                   | Action for Fr                         | iture Work       |                  |
| Resp. Org. // Task Force Concurrence //  B. Identification and Evaluation of Ongoing Corrective Action for Completed Work  A. Preliminary  W/A  B. Final                                                                                                                                                                                                                      | <b>A.</b>   | Preliminary   |                                | e garanta e e e e e e e e e e e e e e e e e e e |                                       |                  |                  |
| Resp. Org. // Task Force Concurrence //  B. Identification and Evaluation of Ongoing Corrective Action for Completed Work  A. Preliminary  W/A  B. Final                                                                                                                                                                                                                      |             |               | _                              |                                                 |                                       |                  |                  |
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| B. Identification and Evaluation of Ongoing Corrective Action for Completed Work  A. Preliminary  N/A  B. Final                                                                                                                                                                                                                                                               | B. 1        | Finel         |                                |                                                 |                                       |                  |                  |
| B. Identification and Evaluation of Ongoing Corrective Action for Completed Work  A. Preliminary  W/A  B. Final                                                                                                                                                                                                                                                               |             | . :           | er.                            | •                                               | , ••                                  |                  |                  |
| B. Identification and Evaluation of Ongoing Corrective Action for Completed Work  A. Preliminary  W/A  B. Final                                                                                                                                                                                                                                                               |             |               |                                | •                                               |                                       |                  |                  |
| B. Identification and Evaluation of Ongoing Corrective Action for Completed Work  A. Preliminary  W/A  B. Finel                                                                                                                                                                                                                                                               | Resp        | . Org.        | , ,                            | / Task For                                      | ce Concurren                          | <b>:</b> •       | 1.1              |
| A. Preliminary  N/A  B. Finel                                                                                                                                                                                                                                                                                                                                                 |             |               |                                |                                                 |                                       |                  |                  |
| T/A  B. Finel                                                                                                                                                                                                                                                                                                                                                                 |             |               | md Evaluation                  | of Ongoing Cor                                  | rective Actio                         | on for Completed | Work             |
| B. Finel                                                                                                                                                                                                                                                                                                                                                                      |             | •             |                                |                                                 |                                       | •                |                  |
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| 78.                                          | Identification | m of Corrective Action for Completed Work                    |         |
|----------------------------------------------|----------------|--------------------------------------------------------------|---------|
|                                              | A. Prelimines  |                                                              |         |
|                                              | W/A            |                                                              |         |
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|                                              | 3. Final       |                                                              |         |
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| <u>.                                    </u> |                |                                                              |         |
| <b>53.</b>                                   |                | n and Inspection of Corrective Action for Completed Work     |         |
|                                              | A. Prelimines  |                                                              |         |
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| •                                            | B. Final       |                                                              |         |
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|                                              | Resp. Org.     | / / Task Force Concurrence                                   | . / / . |
| 93.                                          | Identification | n and Evaluation of Ongoing Corrective Action for Future Wor | ·k      |
|                                              | A. Prelimina   | ·                                                            | -       |
|                                              |                |                                                              |         |
|                                              | W/A            |                                                              |         |
| F                                            |                |                                                              |         |
| ł                                            | B/A            |                                                              |         |
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| ł                                            | B/A            |                                                              |         |
| ł                                            | B/A            |                                                              |         |

| 108. | Identification of Corrective Action for Future Work |                |              |        |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   |     |  |
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| 118. | Tan                                                 | lementation of | Corrective   | Action | for Tuture  | Mork                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |   |     |  |
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|      | 3.                                                  | Final          |              |        |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   |     |  |
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|      | Res                                                 | p. Org.        | ,            | ·      | Tack Young  | Concurrence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | : | 1   |  |
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| 128. |                                                     |                | ffectiveness | of Co  | rrective Ac | tion for Future Wor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | t | •   |  |
|      | ۸.                                                  | Preliminary    |              |        |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   |     |  |
|      |                                                     | W/A            |              |        | •           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   |     |  |
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|      | В.                                                  | Finel .        |              | •      |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   |     |  |
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TVL Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

1. Task Force Category 30 for Watts Bar Nuclear Plant - Unit 1

2. Task Force Category Description and Related B&V Findings: Failure to satisfy design criteria for 1) monitoring operability and 2) providing adequate electrical protective devices for the motor driven auxiliary feed water pu lube oil pump: 1) F100 and 2) F136

## 3. Evaluation for Cause

## A. Preliminary

1) and 2) SWP failed to adequately design and/or review the design of safety system support equipment which operates full time with respect to criteria for status monitoring and electrical protection. The cause is not clearly understood but was due to inadequate implementation of existing design control requirements.

1) Design was based on EN DES assumption that equipment would not be taken out of service more frequently than once a year; hence status monitoring was not required (Ref: RG 1.47). NUC PR maintenance has determined that this is not the case; however. EN DES was never notified of this fact due to lack of procedures addressing status monitoring requirements.

2) Failure to comply with EN DES-EP 4.25 due to inadequate knowledge of engineering procedures by EM DES personnel.

Resp. Org. 9. 0. Colling 825/83 Task Force Concurrence Village 5 KL/83

## 4. Evaluation for Generic Examples

#### A. Preliminary

1) and 2) A review needs to be performed of all WBMP designs involving full time operating equipment which supports the operability of safety related equipment to identify generic examples where status monitoring and/or electrical protection were not satisfied.

developed

1) A generic review will be conducted after -58 -986 (EEB) -prepares a procedure is specifying how MUC PR and EM DES will exchange information regarding maintenance schedules for plant equipment.

2) Review of all full-time operating equipment supporting safety-related equipment determined only one other example of failure to electrically protect devices: Aux FW pump valve electro-bydraulic actuators (1-MTR-3-122-A, 1-MTR-3-132-B) (Ref: Memo from C. C. Fisher to WBP Files dated June 10, 1983 (WBP 830610 032).

Resp. Org. 9. D. College 8 125 183 9. D. College 3 19 18 8 /25/83 Task Force Concurrence

# 5. Licensing Basis Satisfaction

A. Preliminary

1) The licensing basis was not satisfied since the MD AFF lube oil pump was expected to be deliberately made inoperable more frequently than annually, hence requiring status monitoring.

2) The licensing basis was not satisfied since neither the MD AFF lube oil pump motor nor its cable were adequately protected as specified in FSAR 8.3.1.1.

B. Final

1) Licensing basis is satisfied for the MD AFP lube oil pump since it has been added to status monitoring on ECN 3827.

Resp. Org. 9. D. Ordine 8/25/83 Task Force Concurrence 25/ 8 bt 183

# 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

## A. Preliminary

1) The task force is not aware of any action.

2) BCM 3636 identifies F-136 and commits to addition of appropriate electrical protection. This is appropriate except that it does not cover generic examples.

#### B. Final

1) BCN 3827 added MD AFW lube oil pump to status monitoring (Ref: EM DES response to finding F-100).

2) BCN 3636 referenced F-136. It also included generic examples specified in 4A.

Resp. Org. 9. D. Colleg. 4/25/83 Task Force Concurrence 26 8 54 83

# 7A. Identification of Corrective Action for Completed Work

A. Preliminary

1) and 2) Addition of appropriate electrical protection and/or status monitoring is needed for all deviations generically identified under 4.

B. Final

1) Generic examples, if found, will be corrected after review in item 4-44 is complete. BEB will provide schedule regarding properation and issue of procedure.

2) Generic deviations included in ECN 3636.

Resp. Org. 9. D. Colline 8/25/83 Task Force Concurrence 3/19/54

- . Implementation and Inspection of Corrective Action for Completed Work
  - A. Preliminary
  - B. Finel (1) CTR R293 will track the completion of past work by reviewing the maintenance schedule to determine if the requirements of status monitoring in RC 1.47 are met. Any deficiencies will be corrected.

(2) ECN 3636 has been completed (SWP 830303 618).

Basp. Org. 9.8. Collins 13 119/14 Task Force Concurrence 26/184

- 9A. Identification and Evaluation of Ongoing Corrective Action for Future Work
  - A. Preliminary
    - 1) and 2) The task force is not aware of any action.
  - Final

    1) Procedure will become part of EN-DES issued and controlled documents and will B. Final be reviewed periodically per Engineering Procedures Training and Utilization Program (Ref: memorandum from M. M. Sprouse to Those listed dated February 26, 1983 (MEB 820226 255).
  - 2) Engineering Procedures Training and Utilization Program initiated by H. W. Sprouse P4/13

to Those listed dated February 26, 1982 (NEB 820226 255), Resp. Org. 9:00 8 /25/83 Task Force Concurrence T.D. Colore 3/19/84

10A. Identification of Corrective Action for Future Work

- A. Preliminary
  - 1) and 2) More definitive causes must be established in 3 in order to identify appropriate actions to improve future work.
- B. Finel
  - 1) Same as (2).
  - 2) Mone necessary due to ongoing corrective action specified in 9A.

Easp. Org. 9. D. Colline 8/25/83 Task Force Concurrence 2

| A   | . Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ,                                             |                                             |                             |                                                                       |                            |     |
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| B   | _                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                               |                                             | *                           | urrence 7                                                             |                            |     |
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| 3   | . Final                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                               |                                             |                             |                                                                       |                            |     |
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| A   | Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ·<br>•                                        |                                             |                             |                                                                       |                            |     |
|     | W/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |                                             |                             |                                                                       |                            |     |
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| 3.  | . Final                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                               |                                             | •                           |                                                                       |                            |     |
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| B. Identification           | m of Corrective Action for  | Completed Work           |             |
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| W/A                         |                             |                          | •           |
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| B. Final                    |                             |                          |             |
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| Rasp. Org.                  | / / Tas                     | k Force Concurrence      | 11          |
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|                             | on and Inspection of Correc | tive Action for Complete | a work      |
| A. Prelimit                 | ary                         | ·                        |             |
| W/A                         |                             |                          | ÷ .         |
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|                             | ion and Evaluation of Ongoi | ng Corrective Action for | Puture Work |
| 9B. Identificat             |                             |                          |             |
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| A. Prelimi                  | nery                        |                          |             |
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| A. Prelimi<br>W/A           |                             |                          |             |
| A. Prelimi<br>W/A           |                             |                          |             |

|      | A.               | Preliminary                                     |          |                |             |             |                    |                                              |
|------|------------------|-------------------------------------------------|----------|----------------|-------------|-------------|--------------------|----------------------------------------------|
|      |                  | M/A                                             |          |                |             |             |                    |                                              |
|      |                  | •                                               |          |                |             | •           |                    |                                              |
|      |                  |                                                 |          |                |             |             |                    |                                              |
|      | B.               | Final                                           |          |                |             |             |                    |                                              |
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|      |                  |                                                 |          |                | •<br>•      |             |                    |                                              |
|      |                  | lementation of                                  | Correcti | ve Actio       | n for Futur | e Work      |                    |                                              |
|      | A.               | Preliminary                                     |          |                |             |             |                    |                                              |
|      |                  | W/A                                             |          |                |             |             |                    | •                                            |
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|      | B.               | Pinal                                           |          | * .            |             |             |                    |                                              |
|      | B                | Pinal                                           |          |                |             |             |                    |                                              |
|      | <b>3.</b>        | Pinal                                           |          |                |             |             |                    |                                              |
|      | B                | Pinel                                           |          |                |             |             |                    |                                              |
|      | •                | Pinal                                           |          |                | Task Force  | e Concurred | ce                 |                                              |
|      | Res              | p. Ocg.                                         |          |                | -           |             |                    | <u> </u>                                     |
| 123. | Res              | p. Org                                          | fectiven | / /            | -           |             |                    | <u>                                     </u> |
| 23.  | Res              | p. Orgification of Ef                           | fectiven | / /            | -           |             |                    | <u>/ /</u>                                   |
| 23.  | Res              | p. Org                                          | fectiven | / /            | -           |             |                    | <b>1-1</b>                                   |
| 23.  | Res              | p. Orgification of Ef                           | fectiven | ese of (       | -           |             |                    |                                              |
| 23.  | Res              | p. Orgification of Ef                           | fectiven | ess of (       | -           |             |                    | <u>/ /</u>                                   |
| 123. | Res              | p. Org<br>ification of Rf<br>Preliminary<br>M/A | fectiven | / /            | -           |             |                    | <i>1-1</i>                                   |
| 123. | Res<br>Ver<br>A. | p. Org ification of Ef Preliminary W/A Final    | ·        |                | Orrective A | ction for I |                    |                                              |
| 123. | Res<br>Ver<br>A. | p. Org ification of Ef Preliminary M/A Final    | ·        |                | Orrective A | ction for I |                    | <u>/ /</u>                                   |

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TVA Each Porce for Review of Black & Vectoh Findings

EVALUATION SHEET

Nov. El Date 5/27/83

- 1. Task Porce Category 31 for Watte Ber Muclear Plant Unit 1
- 2. Task Force Category Description and Related B&V Findings: Editorial discrepancies in licensing documents: Fil9 and F321.
- 3. Evaluation for Cause
  - A. Preliminary

The preparation process and checking through CEDC and Power Regulatory Staff did not identify and correct all editorial discrepancies.

B. Finel

Both findings describe FSAR errors that are editorial in nature.

Rasp. Org. OTCLA 4 137183 Task Force Concurrence 24 4 102153

- 4. Evaluation for Generic Examples
  - A. Preliminary

The low editorial error rate found in AFW commitments combined with their lack of plausible negative impact does not warrant an evaluation for generic examples at this time.

B. Final

No further evaluation is required.

Rasp. Org. DTClff 4137183 Task Force Concurrence 24/2-4/27/83

| 5.          | Lie       | encing Besie                                             | Satisfaction                                           |                                           |                                          |                                         |                                              |                       |
|-------------|-----------|----------------------------------------------------------|--------------------------------------------------------|-------------------------------------------|------------------------------------------|-----------------------------------------|----------------------------------------------|-----------------------|
|             | ٨.        | Preliminary                                              |                                                        |                                           |                                          |                                         |                                              |                       |
|             |           | The editoria defined in t                                | il seture of<br>the FSAR. Th                           | the FSAR erefore, ac                      | rrors does<br>) further (                | net jeeper<br>metica requ               | dise the lic<br>ired.                        | easing basis          |
|             | <b>3.</b> | for the plan<br>required. I<br>as a result<br>this type. | e do not reprete. Therefor lowever, it s of the catego | e, no furti<br>hould be no<br>ony 4 find: | her action<br>oted that (<br>ings will ( | on this ca<br>corrective<br>corve to co | tegory of fi<br>setion taken<br>rrect 75AL e | ndings is<br>/plasmed |
|             | Res       | p. 0eg. <u>197</u>                                       | Cly 41                                                 | 7/83 Tai                                  | ik Force C                               | ecurrence _                             | W                                            | 412183                |
| 4.          | Ide       | atification (                                            | and Evaluation                                         | n of Ongoi                                | ig Correct:                              | ive Action                              | for Complete                                 | d Work                |
|             | <b>A.</b> | Preliminary                                              |                                                        |                                           |                                          | . * #*                                  |                                              | ÷                     |
|             |           | T/A                                                      |                                                        |                                           |                                          |                                         |                                              |                       |
|             | 3.        | Finel                                                    |                                                        |                                           |                                          |                                         |                                              |                       |
|             | le.       | p. Ocg                                                   |                                                        | Ta                                        | sk Force Co                              | DEUTTERCE                               |                                              |                       |
| <b>7 A.</b> | Ide       | atification o                                            | of Corrective                                          | Action for                                | Complete                                 | Work                                    |                                              |                       |
|             | 4.        | Preliminary                                              |                                                        |                                           |                                          | •                                       | ·-                                           |                       |
|             |           | T/A                                                      |                                                        |                                           |                                          |                                         |                                              |                       |
|             | 3.        | Final                                                    |                                                        |                                           |                                          |                                         |                                              | •                     |
|             |           |                                                          |                                                        |                                           |                                          |                                         | _                                            |                       |
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| A. Fralininary  Basp. Org / _ Task Force Concurrence / _  A. Mentification and Evaluation of Ongoing Corrective Action for Future Mork  A. Praliminary  H/A  B. Final  A. Mentification of Corrective Action for Future Work  A. Preliminary  H/A  B. Final  B. Final   | lå.        | -          | lementation   | and Inspect  | ion of ( | Corrective | Action (  | for Comple | ted Work   |       |   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------|---------------|--------------|----------|------------|-----------|------------|------------|-------|---|
| Emp. Org Task Force Concurrence                                                                                                                                                                                                                                         |            | A.         | Proliminary   | ,            |          | ~          |           |            |            |       |   |
| Resp. Org. // Task Force Concurrence //  Litentification and Evaluation of Ongoing Corrective Action for Future Work  A. Preliminary  W/A  B. Final  Litentification of Corrective Action for Future Work  A. Preliminary  M/A  B. Final                                |            |            | W/A           |              |          |            | *         |            |            |       |   |
| Resp. Org. // Task Force Concurrence //  Lidentification and Evaluation of Ongoing Corrective Action for Future Work  A. Preliminary  W/A  Basp. Org. // Task Force Concurrence //  Lidentification of Corrective Action for Future Work  A. Preliminary  W/A  B. Final |            |            |               |              |          |            |           |            | •          |       |   |
| Resp. Org. // Task Force Concurrence //  Literatification and Evaluation of Ongoing Corrective Action for Future Work  A. Preliminary  W/A  B. Final  Literatification of Corrective Action for Future Work  A. Preliminary  W/A  B. Final                              |            |            |               |              |          |            |           |            |            |       |   |
| Description and Evaluation of Ongoing Corrective Action for Future Work  A. Preliminary  W/A  B. Final  Lieutification of Corrective Action for Future Work  A. Preliminary  W/A  B. Final                                                                              |            | 3.         | Pinel         |              |          | • .        |           |            |            |       |   |
| Description and Evaluation of Ongoing Corrective Action for Future Work  A. Preliminary  W/A  B. Final  Lieutification of Corrective Action for Future Work  A. Preliminary  W/A  B. Final                                                                              |            |            |               |              |          |            |           | •          |            |       |   |
| Mean Common and Evaluation of Ongoing Corrective Action for Future Work  A. Preliminary  W/A  B. Final  Lieutification of Corrective Action for Future Work  A. Preliminary  W/A  B. Final                                                                              |            |            | •             |              |          |            |           |            | •          |       |   |
| Description and Evaluation of Ongoing Corrective Action for Future Work  A. Preliminary  W/A  B. Final  Lieutification of Corrective Action for Future Work  A. Preliminary  W/A  B. Final                                                                              | 1          |            | h. Ore        | •            | , ,      | Sach Sac   |           |            |            |       |   |
| Bosp. Org Task Force Concurrence / /  Lidentification of Corrective Action for Future Work  A. Preliminary  H/A  B. Final                                                                                                                                               |            |            | . «           |              |          |            | te Concu  |            |            |       | _ |
| Bosp. Org Task Force Concurrence / /  Lidentification of Corrective Action for Future Work  A. Preliminary  H/A  B. Final                                                                                                                                               | <b>L</b> : | Ide        | ntification   | and Eveluet  | ion of ( | ngoing Cor | rective   | Action fo  | r Future W | ork   |   |
| Bosp. Org Task Force Concurrence                                                                                                                                                                                                                                        |            |            |               | ·            |          |            |           |            |            |       |   |
| Resp. Org. // Task Force Concurrence // Lidentification of Corrective Action for Future Work  A. Preliminary N/A  B. Final                                                                                                                                              |            |            | W/A           |              |          |            |           | ٠          |            | •     |   |
| Resp. Org. // Task Force Concurrence // Lidentification of Corrective Action for Future Work  A. Preliminary N/A  B. Final                                                                                                                                              |            |            |               |              |          |            |           |            | •          |       |   |
| Resp. Org. // Task Force Concurrence // Lidentification of Corrective Action for Future Work  A. Preliminary N/A  B. Final                                                                                                                                              |            |            |               |              |          |            |           |            |            |       |   |
| L. Identification of Corrective Action for Future Work  A. Preliminary  W/A  B. Final                                                                                                                                                                                   | 1          | <b>B</b> . | Pinal         |              |          |            |           |            |            |       |   |
| A. Preliminary  W/A  B. Final                                                                                                                                                                                                                                           |            |            |               |              |          | 4          |           |            |            |       |   |
| A. Preliminary  W/A  B. Final                                                                                                                                                                                                                                           |            |            | ;             |              |          |            |           |            |            |       |   |
| L. Identification of Corrective Action for Future Work  A. Preliminary  W/A  B. Final                                                                                                                                                                                   |            | _          |               | ,            | * •      |            |           |            |            | * * * |   |
| A. Preliminary  W/A  B. Final                                                                                                                                                                                                                                           |            | Res        | p. 0cg        | <del></del>  | Щ        | Task For   | te Concu  |            |            |       |   |
| A. Preliminary  W/A  B. Final                                                                                                                                                                                                                                           | ٠ :        | <u>Ide</u> | etification ( | of Correctiv | re Actio | a for Futu | re Hork   |            |            |       | _ |
| H/A  B. Final                                                                                                                                                                                                                                                           |            |            |               |              |          |            |           |            |            |       |   |
| B. Final                                                                                                                                                                                                                                                                |            |            | •             |              |          |            |           | •          |            |       |   |
|                                                                                                                                                                                                                                                                         |            |            |               |              |          |            |           |            |            |       |   |
|                                                                                                                                                                                                                                                                         |            |            | •             |              |          |            |           |            |            |       |   |
| Total One                                                                                                                                                                                                                                                               | . 1        | В.         | Finel         | •            |          |            |           |            |            | •     |   |
| Resp. One                                                                                                                                                                                                                                                               |            |            |               |              |          |            |           | •          |            |       |   |
| Total One                                                                                                                                                                                                                                                               |            |            |               |              |          |            |           |            |            |       |   |
| Body, Ore. / / Body Times 6                                                                                                                                                                                                                                             |            |            |               |              |          |            |           | * .        |            |       |   |
| Task Force Concurrence //                                                                                                                                                                                                                                               | 1          | les        | o. Org.       | ı            | , ,      | Test To-   | ·a Camani | -          |            | , ,   |   |

| 114. |            | plementation of Corrective Action for Future Work                          |
|------|------------|----------------------------------------------------------------------------|
|      | <b>A.</b>  | Preliminary                                                                |
|      |            | W/A                                                                        |
|      |            |                                                                            |
|      |            | • •                                                                        |
|      | <b>3.</b>  | Fine1                                                                      |
|      |            |                                                                            |
|      |            |                                                                            |
|      |            |                                                                            |
|      | Res        | p. Org Task Force Concurrence                                              |
| 12A. | Ver:       | ification of Effectiveness of Corrective Action for Future Work            |
|      |            | Preliminary                                                                |
|      |            | <b>M/A</b>                                                                 |
|      |            |                                                                            |
|      |            |                                                                            |
|      | <b>3.</b>  | Pinel                                                                      |
|      |            |                                                                            |
|      |            | 그는 그들은 그는 그들은 얼굴한 동원이 나는 이 이 없는데                                           |
|      | 200        | ip. Org. // Task Force Concurrence //                                      |
|      |            | p. Org Task Force Concurrence /                                            |
| 63.  | Ide        | mtification and Evaluation of Ongoing Corrective Action for Completed Work |
|      | ٨.         | Preliminary                                                                |
|      |            | <b>1/A</b>                                                                 |
|      |            |                                                                            |
|      | B.         | Finel                                                                      |
|      | <b>-</b> 0 |                                                                            |
|      |            |                                                                            |
|      |            |                                                                            |
|      | le s       | p. Org. // Task Force Concurrence //                                       |

| 78. |           | ntification of Corrective Action for Completed Work  Preliminary                |
|-----|-----------|---------------------------------------------------------------------------------|
|     |           | #/A                                                                             |
| •   |           |                                                                                 |
|     |           |                                                                                 |
|     | 3.        | Finel                                                                           |
|     |           |                                                                                 |
|     |           |                                                                                 |
|     | Res       | p. Org. // Task Force Concurrence //                                            |
|     | _         |                                                                                 |
| os. |           | lementation and Inspection of Corrective Action for Completed Work  Preliminary |
|     | A.        | W/A                                                                             |
|     |           | ***                                                                             |
|     |           |                                                                                 |
|     | 3.        | Finel                                                                           |
| ٠.٠ |           |                                                                                 |
|     |           |                                                                                 |
|     | Zee       | P. OFR. // Task Force Consumence                                                |
|     |           | o. Org. // Task Force Concurrence //                                            |
| 93. | Ide       | atification and Evaluation of Ongoing Corrective Action for Future Work         |
|     | <b>A.</b> | Preliminary                                                                     |
|     |           | W/A                                                                             |
|     |           |                                                                                 |
|     | в.        | Final                                                                           |
|     |           |                                                                                 |
|     |           |                                                                                 |
|     |           |                                                                                 |
|     |           |                                                                                 |

|     | <b>A.</b> | Preliminary                                            | •         |         |
|-----|-----------|--------------------------------------------------------|-----------|---------|
|     |           | T/A                                                    |           |         |
|     |           | ,                                                      |           |         |
|     |           | •                                                      |           |         |
|     | 3.        | Pinal                                                  |           |         |
| •   |           |                                                        | ,         |         |
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|     | 200       | ip. Org. / / Task Force Concurrence                    |           |         |
|     |           | pp. Org. // Task Force Concurrence                     | •         | <u></u> |
| 13. |           | elementation of Corrective Action for Future Work      |           |         |
|     | ٨.        | Preliminary                                            |           |         |
|     |           | <b>11/A</b>                                            |           |         |
|     |           |                                                        |           |         |
|     |           |                                                        |           |         |
|     | 3.        | Pinel                                                  |           |         |
|     |           |                                                        |           |         |
|     |           |                                                        |           |         |
|     | _         |                                                        |           |         |
|     | Ma s      | p. Org Task Force Concurrenc                           | •         |         |
| 23. | Ver:      | ification of Effectiveness of Corrective Action for Pu | ture Work |         |
|     |           | Proliminary                                            |           |         |
|     |           | 11/4                                                   |           |         |
|     | •         |                                                        |           |         |
|     |           |                                                        |           |         |
|     | B.        | Finel                                                  | •         |         |
|     |           |                                                        |           |         |
|     |           |                                                        |           |         |
|     |           |                                                        |           |         |
|     | _         | p. Org. // Task Force Concurrenc                       |           |         |

TVA Task Force for Review of Black & Vestch Findings

EVALUATION SHEET

Rev. <u>83</u> Date <u>12/19/83</u>

- 1. Task Force Category 12 for Watta Bar Muclear Plant Unit 1
- Task Force Category Description and Related 86V Findings: Incompatible nonelectrical drawings: P753, P858, P865, P866, P932, P939, P942, P976, P983.
- 3. Evaluation for Cause
  - A. Preliminary
    - Inadequate drawing checking and design verification prior to issuance.
    - Inadequate recognition of need to revise companion drawings during design change process.
  - B. Final

The following causes are identified:

- Inadequate coordination between branches per EP 4.04 as to checking and design verification prior to the issuance of drawings
- Drawings were not checked thoroughly to insure correctness and legibility
- Design and construction are not complete at this time

Resp. Org. J. Mosl 5/5/83 Task Force Concurrence 2/15/83

- 4. Evaluation for Generic Examples
  - A. Preliminary

Problem is generic to hanger drawings and isometrics.

B. Final

A review of feedwater isometric, 47W401-212, was performed and this problem was not found. A more extensive review will be performed under steps 6, 7 and 8 to assure compliance with documentation.

Resp. Org. 99 Mark 5 15 183 Task Force Concurrence 24 519183

|       | ۸.        | Preliminary This situation provides an inconvenience to COMST; however, the controls required successfully correlate the hanger location on the physical drawing with the hanger location on the analysis isometric to satisfy the total tolerance prescribed in G-precludes improper hanger installation as a result of these momenclature discrepancies.                                                                       |
|-------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | <b>3.</b> | Final This situation is only an inconvenience to COMST. TVA walkfown inspection, WBM 79 14, in place per ECM 3100 will identify any visual discrepancies, and drawings will be corrected. Hangers are installed per hanger detail analysis isometrics. This method prevents improper hanger installation even though nonenclature discrepancie exist. Inspection will be more stringent in the future as a result of 36V review. |
| :     | Res       | o. Ors. 99 Mach 5 15/83 Task Force Concurrence 1/2/83                                                                                                                                                                                                                                                                                                                                                                            |
| 64.   | Ide       | atification and Evaluation of Ongoing Corrective Action for Completed Work                                                                                                                                                                                                                                                                                                                                                       |
|       | 3.        | Preliminary  #/A  Pinal  Pinal  Task Force Concurrence                                                                                                                                                                                                                                                                                                                                                                           |
| . 7▲. | Ides      | atification of Corrective Action for Completed Work                                                                                                                                                                                                                                                                                                                                                                              |
|       |           | Preliminary  M/A                                                                                                                                                                                                                                                                                                                                                                                                                 |
|       | В.        | Final                                                                                                                                                                                                                                                                                                                                                                                                                            |
|       |           |                                                                                                                                                                                                                                                                                                                                                                                                                                  |

|           |                  | Impaction of Corr  | ACCTAS WC[706   | r' ros combre | fee mork       |     |
|-----------|------------------|--------------------|-----------------|---------------|----------------|-----|
| <b>A.</b> | Proliminary      | Y                  |                 |               |                |     |
|           | M/A              | •                  |                 |               |                |     |
| 4         |                  |                    |                 |               |                |     |
|           |                  |                    |                 |               |                |     |
| 3.        | Final            |                    |                 | 1             | ;              |     |
|           |                  |                    |                 |               |                |     |
|           |                  |                    |                 |               | **             |     |
|           |                  |                    | Special Control | •             |                | * * |
| les       | p. Org           | <del></del>        | ask force Con   | CUTTERCE      |                |     |
| . Yda     | orification and  | Evaluation of Ongo | ine Compatie    |               | n Parkers Ho   |     |
|           |                  | PASTMETTON OF ORRO | INE COLLECTIA   | e action to   | t latare so    | FK  |
| ▲.        | Preliminary      | •                  |                 |               |                |     |
|           | H/A              |                    |                 |               |                |     |
|           |                  |                    |                 |               |                |     |
|           |                  |                    |                 |               |                |     |
| 1.        | Final            |                    |                 |               |                |     |
|           |                  |                    |                 |               |                |     |
|           |                  |                    |                 |               |                |     |
|           |                  |                    |                 |               |                |     |
| les       | p. Org.          |                    | ask Force Con   | CUTTERCE      | <del>- :</del> |     |
| 74-       | atification of C | orrective Action f | es Puturo Hor   | ·             |                |     |
|           |                  | orrective action t | or rucure wor   | : 5           | . •            |     |
| <b>A.</b> | Preliminary      |                    | •               |               |                |     |
|           | M/A              | •                  | •               |               |                |     |
|           |                  |                    |                 |               | i de las       |     |
|           |                  |                    |                 | •             | •              |     |
| В.        | Final            |                    |                 |               |                |     |
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|           | 4                |                    |                 |               |                |     |
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| 114.         | Imp | Plementation of Corrective Action for Future Work                                                                                                                                                                                                              |
|--------------|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | ٨.  | Preliminary                                                                                                                                                                                                                                                    |
|              |     | ₩/▲                                                                                                                                                                                                                                                            |
|              |     |                                                                                                                                                                                                                                                                |
|              | 3.  | Pinel                                                                                                                                                                                                                                                          |
|              |     |                                                                                                                                                                                                                                                                |
|              | Les | P. Org Task Force Concurrence                                                                                                                                                                                                                                  |
| 124.         | Ver | ification of Effectiveness of Corrective Action for Future Work                                                                                                                                                                                                |
|              |     | Preliminary                                                                                                                                                                                                                                                    |
|              |     |                                                                                                                                                                                                                                                                |
| <sup>4</sup> | 3.  |                                                                                                                                                                                                                                                                |
|              | •   |                                                                                                                                                                                                                                                                |
|              | Les | p. Org / Task Force Concurrence /                                                                                                                                                                                                                              |
| <del></del>  | 74- |                                                                                                                                                                                                                                                                |
| 95.          |     | ntification and Evaluation of Ongoing Corrective Action for Completed Work  Preliminary                                                                                                                                                                        |
|              |     | The program implemented by OEDC regarding CEB 81-30 is adequate for completed work.                                                                                                                                                                            |
|              | 3.  | Final The preliminary walkdown inspection, CEB 81-30, and final inspection, WBH 79-14,                                                                                                                                                                         |
| •            |     | implemented by OEDC are adequate for all completed work. This is primarily a visual inspection to assure all components are installed as required. Any component problems found from visual inspection will be measured and corrected on all design documents. |
|              |     | p. Org. J. Mond 515 R3 Task Force Concurrence 2/19/83                                                                                                                                                                                                          |

- 78. Identification of Corrective Action for Completed Work
  - A. Preliminary

The plan in 68.A. appears adequate.

B. Final

The plan in 63.3 is adequate.

Resp. Org. 10 Mark 5,5,83 Task Force Concurrence 26 5,9,83

- 8B. Implementation and Inspection of Corrective Action for Completed Work
  - A. Preliminary

H/A

- B. Final
  The preliminary walkdown inspection, CKB 81-30, completed under ECH 2576 for
  Unit 1, plus ECH 4080 to be completed by 12-30-83 were implemented to insure
  that supports are installed at the analysed location. The final walkdown
  inspection, WBH-79-14, has been implemented and any corrective action required
  is underway. This corrective action is being tracked per the disposition of
  HCR WBHSVF 8248 and ECH 3100 and is scheduled to be completed by 1-30-84.
  Resp. Org. 2011ack /2 /21/8 Task Force Concurrence
- 9B. Identification and Evaluation of Ongoing Corrective Action for Future Work
  - A. Preliminary

The task force could not identify any in place or proposed corrective action.

B. Final

Procedures exist within EM DES to prevent these discrepancies from occurring on any future work.

Resp. Org 99 Man 515/83 Task Force Concurrence 24/6-617/83

|      | <b>A.</b> | Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      |           | The implementation of EN DES procedures must be assured so that design output documentation is correct.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| ·    |           | Pinel Design personnel should be made sware of the various existing design and drafting procedures to make sure they are adhered to in the future. Heno from J. C. Standif to Those listed dated 3/1/83 (SWP 830302 015) is a cover memo for SWP AI-1 B2, which initiates a training program on a section basis for all EN DES EPs and all SWP EPs which affect the work of the section. The intent of this program is to ensure that all are familiar with the EPs which control WBP QA activities.  D. Org. 99 Mach. 6 12/122 Task Force Concurrence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 113. | Lap       | lementation of Corrective Action for Future Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|      | ٨.        | Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|      |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|      |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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|      | -         | See response to item 108.8.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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|      | Les       | p. Org. One 1212/183 Task Force Concurrence 26/2/183                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 199  | 7         | ification of Effectiveness of Corrective Action for Future Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|      |           | Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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|      | 3.        | Final                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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TVA Task Force for Review of Black & Weatch Findings

EVALUATION SHEET

Nov. 81 Date 4/6/83

- 1. Task Porce Category 33 for Matta Bar Meclear Plant Unit 1
- Task Force Category Description and Related 36V Findings:
   Inadequate cable tagging: 7807 and 7809

# 3. Evaluation for Cause

A. Preliminary - Finding F807 was caused by oversight. The information on the tag had the correct cable number and that it was safety-related but the color of the tag was incorrect. Finding F809 was caused by repetitious rework which resulted in the legibility of the tag to be in question.

#### B. Finel

Construction agrees with the preliminary evaluation.

-Finding F807 was definitely caused by oversight. The cable was tagged with the correct colored tag within 5 feet of the incorrect tag.

-Finding F809 was caused by the fact that the hydraulic activator had to be removed several times during construction. Bydraulic oil inadvertently spilled on the tag and caused the identifier legibility problem.

Basp. Org. Ed Bush 4 1/8/83 Task Force Concurrence Warm 14/18/83

### 4. Evaluation for Generic Examples

#### A. Preliminary

This is not considered to be generic due to the low frequency and the findings do not present a sefety problem.

### B. Final

Construction agrees with the preliminary evaluation. These findings are not considered to be generic because they are isolated cases. A construction walk-through inspection is conducted and also a joint COMST/NOC PR walkthrough inspection is conducted prior to transfer. These walkthroughs are designed to find and correct these type errors.

Resp. Org. Ed Bunk 4/18/83 Task Force Concurrence The 41/5/83

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| 12A. Verificat | ion of Tee |                                               |          | ·         | lwa 'Aar | ion fo  |                                        |           |        |                                       | _  |
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| 3. Finel       |            |                                               |          |           |          |         |                                        |           |        | · · · · · · · · · · · · · · · · · · · |    |
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| 6B. Identific  | stion and  | Evaluatio                                     | of 0     | ngoing    | Correc   | tive A  | tion for                               | r Complet | ed Vor | :k                                    |    |
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| 73. | Ide         | atification | of Correctiv | re Astion for   | Completed Worl | •                                      |       |
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| 83. | <b>Ta</b> y | lementation | and luspecti | ion of Correct: | ive Action for | Completed Work                         |       |
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| 98. | Ide         | ntification | and Evaluati | ion of Ongoing  | Corrective Ac  | tion for Future                        | ilork |
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| B. Identification of  | Corrective Action for  | Future Work        |          |    |
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| A. Preliminary        | Corrective Action for  | Puture Work        |          |    |
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| B. Verification of Ef | fectiveness of Correct | ive Action for Put | ure Work |    |
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TVA Tack Porce for Bavior of Black & Vestch Findings

### SLACE & VEATCE EVALUATION SERBI (Continuation Sheet)

- 5. Licensing Basis Satisfaction (cont'd from page 2)
  - A. Preliminary

Accurate tagging is a means to improve control over construction inspection status and maintenance during plant operation.

- The miscolored tag identified under F-807 would hinder neither objective since the tag was properly inscribed.
- Only one example of F809 was identified and it was caused by repetitious remork involving removal and reinstallation of the component. (This finding cannot be use-us-is.) Since punchlist preparation and transfer inspection under WBN QCI 1.22 has been designed to identify and correct generic examples of damage due to work subsequent to final construction inspection this procedure would have identified and corrected this error.

Therefore, no further action required.

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. - RO R1 Date - - 7/4/85 - 18/83

- 1. Task Force Category 34 for Matts Ber Muclear Plant Unit 1
- 2. Task Force Category Description and Related 86V Findings: "Out of function" feature of a drawing was not in agreement with the latest design drawing showing the detailed design of the "out of function" feature: F857, F910, F982, F984, F985, F986, F987, F988, F989, F992, F993
- 3. Evaluation for Cause
  - A. Preliminary

"Out of function" features have no effect on the technical adequacy of drawings and are for general location value. Checking of drawings and subsequent revisions of drawings do not include ensuring that all "out of function" features on drawings are in agreement with the latest detailed design for the feature.

B. Finel

Same as preliminary.

Resp. Org. A. Jonaton 4/24/83 Task Porce Concurrence 2/26/83

- 4. Evaluation for Generic Examples
  - A. Preliminary

This example is typical of other discrepancies in "out of function" features. No sampling program is necessary because there are no potential deviations.

B. Final

Same as preliminary.

Resp. Org. A. Journ 4/26/83 Task Force Concurrence 24/26/83

| 3. | Lic        | ensing Basis Satisfaction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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|    | A.         | Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|    |            | These drawing discrepancies are related to "out of function" information. This information is not used to design, construct, or operate the plant. The incompatibility of this information on these drawings does not result in the failure to satisfy the licensing basis. We further evaluation is required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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|    |            | Same as preliminary.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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|    | kesp       | . Org. 1. tom abon 4/24/83 Task Force Concurrence 21/2 4/24/83                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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|    |            | stification and Evaluation of Ongoing Corrective Action for Completed Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|    | <b>~</b> • | Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|    |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|    |            | 어느는 말이 있는 사람들이 일 생활이 맛있었다. 생각 이 얼마나 그                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|    | в.         | Pinel.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|    |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|    |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|    |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|    | Res        | p. Org. / / Task Force Concurrence / /                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| _  | Talas      | ntification of Corrective Action for Completed Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| •  |            | Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|    |            | W/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|    |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|    |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|    | В.         | Final                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|    |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|    |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|    |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|    | Res        | p. Org. // Task Force Concurrence //                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

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|------|-------------|-----------------|--------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----|------|
| 84.  |             | plomentation as | d Inspection | of Corre  | etive Ac                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | tion for | Complet  | ed Work  |    |      |
|      | A.          | Preliminary     |              |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |          |          |    |      |
|      |             | W/A             |              |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |          |          |    |      |
| -    |             |                 |              |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |          |          | ٠  |      |
|      | _           |                 |              |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |          |          | •  |      |
|      | 3.          | Final           |              |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |          |          |    |      |
|      |             |                 |              | • •       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |          |          |    |      |
|      |             |                 |              |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          | • . •    |          |    |      |
|      | B           |                 |              | •         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |          | •        |    |      |
|      |             | p. Org.         |              | 74        | sk force                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Concurr  |          |          |    | •    |
| 94.  | Ide         | ntification an  | d Evaluation | of Ongo   | ng Corre                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ctive Ac | tion for | Future W | ek | -    |
|      |             | Preliminary     |              |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ,        |          |          |    |      |
|      |             | W/A             |              |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |          |          |    |      |
|      |             |                 |              |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |          |          |    |      |
|      |             |                 |              |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |          |          |    |      |
|      | B.          | Final           |              |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |          |          |    |      |
|      |             | in the second   |              |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |          |          | •  |      |
|      |             |                 |              |           | ing the first of the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second se |          |          |          |    | ar a |
|      |             |                 |              |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          | • .      |          |    |      |
|      | Res         | p. Org.         |              | 14        | sk force                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Concurr  | mce      |          | 11 |      |
| 104. | Ide         | mtification of  | Corrective   | Action fo | r Future                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |          | ٠.       |          |    |      |
|      |             | Preliminary     |              |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |          |          |    |      |
|      |             | W/A             |              |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          | •        |          |    |      |
| •    |             | #/A             |              |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | :        |          |          |    |      |
|      |             |                 |              |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          | •        | ,        |    |      |
|      | 3.          | Final           |              |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | •        |          |          |    |      |
|      |             |                 | •            |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |          |          |    |      |
|      |             |                 |              |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | *        |          | *        |    |      |
|      |             |                 | •            |           | •                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ٠        |          |          |    |      |
|      |             |                 |              |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          | • •      |          |    |      |
|      | <b>KQ</b> ( | p. Org.         |              | / T4      | sk Force                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Concurr  |          |          |    |      |

| IIA. | Implementation | a of Corr | ective  | Action      | for P       | sture We    | rk.              | •       |          |         |   |
|------|----------------|-----------|---------|-------------|-------------|-------------|------------------|---------|----------|---------|---|
|      | A. Prelimine   |           |         |             | , , ,       |             | •                | ;       |          | •       | • |
|      | H/A            | · y       |         |             |             |             |                  |         |          |         |   |
|      | a/ <b>a</b>    |           |         |             |             |             |                  |         |          |         |   |
|      |                |           |         |             |             |             |                  |         |          |         |   |
|      | B. Final       |           |         |             |             |             |                  |         |          |         |   |
|      |                | •         |         |             |             |             |                  |         | .*       |         |   |
|      |                | •         |         | ٠           |             |             | ,                |         |          |         |   |
|      |                |           |         | · , ·       |             |             |                  |         |          | *       |   |
|      | B              |           |         |             |             |             |                  |         |          |         |   |
|      | Resp. Org.     |           |         | <del></del> | Task 1      | force Co    | <u>acurren</u> c | :       |          |         |   |
| 24.  | Verification ( | of Effect | ivenes  | of Co       | rrecti      | re Actio    | a for P          | iture W | ork      |         |   |
|      | A. Prelimine   |           |         |             |             | , c         |                  |         |          |         |   |
|      | H/A            | -,        |         |             |             |             |                  |         |          |         |   |
|      | 0/A            |           |         |             |             |             |                  |         |          |         |   |
|      |                | 4:        |         |             | a de Artico |             |                  |         |          |         |   |
|      | B. Finel       |           |         |             |             |             |                  |         |          |         |   |
|      |                |           |         |             |             |             |                  | ·       | J. 18    |         |   |
|      |                | -         |         |             |             |             | · · · · · · · ·  |         |          |         |   |
|      |                | •         |         | h.          |             | ٠.          |                  | •       |          | ٠       |   |
|      | Resp. Org.     |           |         |             | Task !      | force Co    | ncurrenc         |         |          |         | / |
|      |                |           |         |             |             | <del></del> |                  |         |          |         |   |
| 95.  | Identification |           | luation | of On       | going (     | orrecti     | ve Actio         | m for C | iomplete | ed Work |   |
|      | A. Preliminer  | ry        |         |             |             |             |                  |         | •        |         |   |
|      | H/A            |           |         |             | •           |             |                  |         |          |         |   |
|      |                |           |         |             |             |             |                  |         |          |         |   |
|      | B. Finel       |           |         |             | •           |             |                  |         |          |         |   |
|      |                |           |         |             |             |             |                  |         |          |         |   |
|      |                |           |         |             |             |             |                  |         | ;        |         |   |
|      |                |           |         |             |             |             |                  | •       |          | ,       |   |
|      |                |           |         |             |             |             |                  |         |          |         |   |

| 78. | Identification of Corre | ective Action for Completed Work                     |
|-----|-------------------------|------------------------------------------------------|
|     | A. Preliminary          |                                                      |
|     | W/A                     |                                                      |
|     |                         |                                                      |
|     |                         |                                                      |
|     | B. Final                |                                                      |
|     |                         |                                                      |
| ;   |                         |                                                      |
|     | <b>3</b>                |                                                      |
|     | Resp. Org.              | // Task Force Concurrence                            |
| 83. | Implementation and Ins  | pection of Corrective Action for Completed Work      |
|     | A. Preliminary          |                                                      |
|     | H/A                     |                                                      |
| •   |                         |                                                      |
| ٠,  |                         |                                                      |
|     | B. Final                |                                                      |
|     |                         |                                                      |
|     |                         |                                                      |
| •   | _                       |                                                      |
|     | Resp. Org.              |                                                      |
| 93. | Identification and Eval | lustion of Ongoing Corrective Action for Future Work |
|     | A. Preliminary          |                                                      |
|     | H/A                     |                                                      |
|     |                         |                                                      |
|     |                         |                                                      |
|     | B. Finel                |                                                      |
|     |                         |                                                      |
|     |                         |                                                      |
|     |                         |                                                      |

| 103. |                                                     |                 |             |        |            |             |           |          |  |  |  |  |
|------|-----------------------------------------------------|-----------------|-------------|--------|------------|-------------|-----------|----------|--|--|--|--|
|      | Identification of Corrective Action for Future Work |                 |             |        |            |             |           |          |  |  |  |  |
|      | A.                                                  | Preliminery     |             |        |            |             |           |          |  |  |  |  |
|      |                                                     | W/A             |             |        |            |             |           |          |  |  |  |  |
|      |                                                     |                 |             |        |            |             |           |          |  |  |  |  |
|      | _                                                   |                 |             |        |            |             |           |          |  |  |  |  |
|      | 3.                                                  | Finel           | ,           |        | :          |             |           |          |  |  |  |  |
|      |                                                     |                 |             | ٠٠.    |            |             |           |          |  |  |  |  |
|      |                                                     |                 |             |        |            |             | :         |          |  |  |  |  |
|      | Res                                                 | p. Ocg          | ,           | ,      | Task Force | Concurren   |           | , ,      |  |  |  |  |
|      |                                                     |                 |             |        | Team Porce | COUCUITED   |           |          |  |  |  |  |
| 113. | l <del>ap</del>                                     | lementation of  | Corrective  | Action | for Future | Work        | *         |          |  |  |  |  |
|      | A.                                                  | Preliminary     | ie.         |        |            |             |           |          |  |  |  |  |
|      |                                                     | W/A             |             |        |            | ₹ .         |           |          |  |  |  |  |
|      |                                                     | •               |             |        |            |             |           | <b>.</b> |  |  |  |  |
|      | _                                                   |                 |             |        |            |             |           |          |  |  |  |  |
|      | B                                                   | Fine!           |             | ٠      |            |             |           |          |  |  |  |  |
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| 128. | Ver:                                                | ification of Ef | fectiveness | of Cor | Tective Ac | tion for F  | ture Work |          |  |  |  |  |
|      | ٨.                                                  | Preliminary     |             |        |            |             |           | •        |  |  |  |  |
|      |                                                     | H/A             |             |        |            |             |           |          |  |  |  |  |
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| ,    | •                                                   | Final           |             |        | ·          |             |           |          |  |  |  |  |
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TVA Task Force for Neview of Black & Veatch Findings

EVALUATION SHEET

Rev. Ri Date 11/1/83

- 1. Task Force Category 35 for Watts Ber Muclear Plant Unit 1
- 2. Task Force Category Description and Related B&V Findings:

Instantaneous trip setting for motor-operated valve breakers is not in accordance with EN DES criteria and vendor recommendations: F137

- 3. Evaluation for Cause
  - A. Preliminary
    - RN DES critiers and recommendations provided by motor vendors for instantaneous trip setting were not applied correctly for MOV motors rated less than 1/2 hp.
    - Inadequate checking of the drawing to ensure compliance with established criteria.
  - B. Final

See Continuation Sheet (page 7).

Resp. Org. Accessor #17/03 Task Force Concurrence 1/17/83

- 4. Evaluation for Generic Examples
  - A. Preliminary

This finding suggests that this deviation could be applicable to all MOVs with motors rated less than 1/2 hp. Corrective action in step 7A will identify all examples.

B. Final

Finding is generic to all loads fed from motor control center molded case instantaneous only circuit breakers. Corrective action in step 7A identified all examples.

Resp. Org. GALLOTO OM 9 | 83 Task Force Concurrence 11/183

# 5. Licensing Basis Satisfaction

A. Preliminary

- (1) The licensing basis is not satisfied because TVA is committed to meeting the requirements of the Mational Electrical Code and has failed to fulfill this commitment for instantaneous trip settings for motors in MOVs rated less than
- (2) The safety significance will have to be determined for each deviation identified.

Fine!

- (1) Same as above.
- (2) No significance to plant safety. Although instantaneous settings were higher then recom mended settings, all loads required to perform a safty function would perform acceptably.

### 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

The task force is not aware of any corrective action.

B. Finel

Mo ongoing corrective action for completed work was being done at the time of the finding.

Resp. Org. (1918) Task Force Concurrence 11/17/83

### 7A. Identification of Corrective Action for Completed Work

A. Preliminary

Review all safety-related MOVs with motors rated less than 1/2 hp and evaluate their circuit breakers instantaneous trip settings for compliance with the EN DES critiers established in DS-E9.2.1 and the vendor's recommended setting. Revise any settings as required to be in accordance with EN DES criteria and wendor's recommendation.

B. Final Review all safety-related MOVs with motors rated less than 1/2 hp was performed and documented by memo from C. C. Fisher to WBP Files dated June 15, 1983 (WBP 830615 022). The necessary corrections were made on ECNs 3904 (UI) and 3905 (U2) which were closed on September 8, 1983 (closure sheet 104 - WPB 830908 068). (See Continuation Sheet - page 7).

Resp. Org. amason 11 14 183 Task Force Concurrence 21 117183

SA. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

ECRs 3904 (U1) and 3905 (U2) completed and closed on September 8, 1983 closure sheet 104 (WBP 830908 068).

ECH 4251 - work in progress and will be tracked on ECH through completion.

Resp. Org. Laure 9/1/1/03 Task Force Concurrence 2/1/2/83

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

The task force is not aware of any corrective action.

B. Final All designers and checkers have been been told to strictly adhere to all criteria used to prepare EN DES drawings, as part of the engineering procedures training and utilization program initiated by M. M. Sprouse Ref: Memorandum from M. N. Sprouse to Those listed dated February 26, 1982 (NEB 820226 255).

Resp. Org. Language 11 14183 Task Force Concurrence

10A. Identification of Corrective Action for Future Work

A. Preliminary

Provide training to personnel responsible for designing and checking drawings that contain trip settings for MOVs.

B. Final

Mone necessary due to ongoing corrective action specified in 9A.

Resp. Org. (MISTEN 1/ 14/83 Task Force Concurrence 2/ 1/17/83

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|               |     | from M. N.  | Sprouse<br>from J. | action rega<br>to Those li<br>C. Standife | sted d        | ated Teb | TUETY 26.  | 1982 (MES                             | 820226 255): |
|               | _   |             |                    |                                           | •             |          |            | 21/1                                  |              |
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| 12 <b>A</b> . | Ver | ification o | f Bffecti          | veness of C                               | orrect        | ive Acti | on for Pu  | ture Work                             | <u> </u>     |
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| 6B.           | Ide | ntification | and Evalu          | sation of O                               | ngoing        | Correct  | ive Action | n for Compl                           | sted Work    |
|               | A.  | Preliminary | 7                  |                                           |               |          | •          |                                       |              |
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| 73. Identification of | Corrective Action for Completed Work                    |
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| A. Preliminary        |                                                         |
| N/A                   | •                                                       |
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| B. Final              |                                                         |
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| B. Implementation and | Inspection of Corrective Action for Completed Work      |
| A. Preliminary        |                                                         |
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| 23. | Ver      | ification of Ef | fectiveness                           | of Correc         | tive Acti        | on for Fu  | ture Work                              | • .         |          |
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TVA Task Force for Review of Black & Veatch Findings

#### BLACK & VEATCH EVALUATION SHEET (Continuation Sheet)

### 3.B. Final

Division of Engineering Design Electrical Standard 30A301 (issued 10-2-51) which was in effect at the time of Watts Bar initial circuit design, provided no criteria for molded case circuit breaker instantaneous trip settings. Instead, menufacturer's criteria provided as part of the motor control center contract, was used to determine correct settings. On September 28, 1976, TVA Standard 30A301 was superseded by EN DES Standard DS-E9.2.1. This standard specified (for the first time) that Hetiomal Electrical Code criteria would be used to set instantaneous only breakers. EN DES failed to fully retrofit this new criteria into its original design for the following reasons:

- (1) An assumption on the part of the designer and checker attempting to implement this requirement, resulted in setting the majority of breakers one setting too high. This occurred because the designer calculated 13 times the full load current (FLI) and then set the breaker to the next higher setting to prevent nuisance tripping. In actuality, he should have set it on setting lower for strict compliance with the NEC.
- (2) In some cases the existing breaker would have had to be replaced to adhere strictly to the MEC criteria. The designer judged that the lowest setting for the existing breaker, while slightly higher than 13 times FLI, was still adequate. In actuality the breakers should have been replaced for strict compliance with the NEC.

# 7A. B. Final (continued from page 2)

Additionally, all remaining safety-related loads fed from motor control center instantaneous only breakers were reviewed per request from EES dated September 8, 1983 (EES 830908 926). This review determined that 13 breakers required replacement and 385 breakers required resetting. ECN 4251 has been issued to make these corrections. The ECN package includes documentation of the study.

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R1 Date 11/9/53

- 1. Task Force Category 36 for Watts Ber Nuclear Plant Unit 1
- 2. Task Force Category Description and Related B&V Findings: The cable tray fill criteria (FSAR section 8.3.1.4.5) is not assured of being met because of the less than conservative nominal values used for cable cross sectional areas in the cable routing program. F135
- 3. Evaluation for Cause
  - A. Preliminary
    Personnel involved did not identify that this potential deviation from the FSAR
    commitment would result in a condition adverse to quality. After the evaluation
    in Step 5, the cause(s) will have to be determined if the licensing basis is not
    satisfied.
  - B. Final

Refer to 5 A. B., Licensing Basis Satisfaction

Resp. Org. B.L. Suralland 11/10/13 Task Force Concurrence

11/4/83

- 4. Evaluation for Generic Examples
  - A. Preliminary
    After completion of Step 5, this will be evaluated for generic examples if the licensing basis is not satisfied.
  - B. Final

H/A

Resp. Org. A. 1 Surollars 14/0/93 Task Force Concurrence 2 1/11/1/83

- 5. Licensing Basis Satisfaction
  - A. Preliminary
    Licensing basis satisfaction needs to be investigated in the following areas: 1)
    FSAR requirements satisfied; 2) Effect on ampacity if overfill occurs in a power
    tray; 3) The tray dynamic response and tray support loading if tray overfill
    occurs; 4) Fire protection requirements if originally specified for 60% fill.
  - B. Final
    See Continuation Sheet (page 7)

Resp. Org. R.L. Santher 11/10/93 Task Force Concurrence

- 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work
  - A. Preliminary
    The task force is not swere of any corrective action.
  - B. Final

Resp. Org. R.L. Surellone 11/10/93 Task Force Concurrence 2/////83

- 7A. Identification of Corrective Action for Completed Work
  - A. Preliminary
    To be determined if evaluation in Step 5 shows the licensing basis is not satisfied.
  - B. Final

Resp. Org. R.4. Sarallane 11/18/93 Task Force Concurrence Office 11/1453

| ۸. |            |                                                                                                                                                                                                                              | Inspection of Corrective Action for Completed Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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|    | <b>A.</b>  | Preliminary                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| •  | Iden       | tification and E<br>Preliminary<br>The task force i                                                                                                                                                                          | Evaluation of Ongoing Corrective Action for Future Work is not aware of any corrective action.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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Resp. Org. Rt. Swellows 11/10/93 Task Force Concurrence 2/1/1/1/83

B. Final

|      |           | lementation                           | of Correc    | ctive Acti   | on for I             | uture k | lork              |               | •               |        |         |
|------|-----------|---------------------------------------|--------------|--------------|----------------------|---------|-------------------|---------------|-----------------|--------|---------|
|      | A.        | Preliminary                           |              |              |                      |         |                   |               |                 |        |         |
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|      | В.        | Final                                 |              |              |                      |         |                   | · .           |                 |        |         |
|      |           | N/A                                   |              | •            |                      |         | •                 |               |                 | -      | ٠. '    |
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| IZA. |           | ification of                          |              | reness of    | Correcti             | ve Acti | on for F          | ture Wor      | t .             |        |         |
|      | <b>A.</b> | Preliminary                           |              |              |                      | •       |                   |               | Marine Services |        |         |
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| 6B.  | Iden      | tification                            | md Evalu     | ation of     | Ongoing              | Correct | i <b>ve</b> Actio | m for Co      | <b>e</b> pleted | Work   |         |
|      | <b>A.</b> | Preliminary<br>N/A                    |              |              |                      |         |                   |               |                 |        |         |
|      |           | M/A                                   |              | :            |                      |         |                   | A Total       |                 |        |         |
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| 7 <b>B.</b> | Identification of Cor  | rective Action  | for Complete | ed Work            |          |
|-------------|------------------------|-----------------|--------------|--------------------|----------|
|             | A. Preliminary<br>N/A  |                 |              |                    | -        |
|             |                        |                 |              |                    |          |
|             | 3. Final               |                 |              |                    |          |
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|             | Implementation and In  | spection of Cor | rective Acti | on for Completed W | ork      |
|             | A. Preliminary         |                 |              |                    |          |
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|             | B. Final               |                 |              |                    | •        |
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| ъ.          | Identification and Eve | lustion of Ong  | oing Correct | ive Action for Put | ure Work |
|             | A. Preliminary<br>N/A  | •               | •            |                    |          |
|             |                        |                 |              | ,                  |          |
| ;           | B. Final               |                 |              | •                  |          |
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| 1. | Ide  | entification of Corrective Action for Future Work                             |            |
|    | A.   | Preliminary<br>N/A                                                            | •          |
|    |      | #/A                                                                           |            |
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|    | 5.   | Final                                                                         |            |
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| В. | [mp  | plementation of Corrective Action for Future Work                             |            |
|    | A.   | Preliminary<br>N/A                                                            |            |
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|    | В.   | Final                                                                         |            |
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|    | 7.   | ificanian of Titalian                                                         |            |
|    |      | ification of Effectiveness of Corrective Action for Future Wor<br>Preliminary | k          |
| ,  | •••  | N/A                                                                           | •          |
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| 1  | 3.   | Final                                                                         |            |
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### BLACK & VEATCH EVALUATION SHEET (Continuation Sheet)

- 5. Licensing Basis Satisfaction
  - B. Final
  - 1. The PSAR requirements have been satisfied as discussed below.
  - 2. This Black & Veatch finding erroneously identified cables as being installed in power (V4 level) cable trays; whereas, the cables identified are installed in control (V3 level) cable trays. The criteria for tray fill of V4 power trays is 30 percent of the available cross-sectional area of the tray; the tray fill for V3 control and instrumentation (V2 and V1) trays is 60 percent. The cable fill is based on summing the areas of the various cables that are randomly laid in the trays. Any minute variance in nominal cable diameter of power cables has no significance on cable area or tray fill; thus, there is no effect on ampacities of cables installed in power trays.

TVA procures insulated cables at different times for a project. The same type of cable, by identification mark number, meets the same specification even though different vendors may supply the cable. The cables are manufactured following the guidelines of the Insulated Cable Engineers Association (ICEA) standards which allow tolerances for insulation and jacket thickness. Therefore, cable diameters from the same or different vendors generally do vary slightly. Although TVA did not specify a maximum outside diameter (OD) for the WBM cables, vendors normally stay within ICEA tolerances of approximately 5 percent, obviously for competetive reasons. Variations in cable OD of multi-conductor cables are usually attributed to light-weight filler material.

For example, a 2-conductor No. 14 AMG control cable may be manufactured by the flat (two insulated conductors run parallel to each other with an overall jacket—oval shape) method, or by the round (two insulated conductors that are twisted with filler material under the overall jacket—round shape) method. This type cable is used for control functions that convey information or intermittantly operate devices controlling power switching or conversion equipment. Thus, conductor heating is insignificant for control cables, as well as instrumentation cables, and raceway fill does not affect cable ampacity.

For WBM, the majority (approximately 85 to 90 percent) of the two-conductor control cable furnished was constructed by the flat method. This oval-shaped 2-conductor cable was equated to have a nominal OD of .309 inches used for tray fill calculations. Some of the round-shaped two conductor cable has an OD of .404 inches. These two cables have the greatest disparity in OD and thus cross-sectional area as noted in the

### SLACK & VEATCH EVALUATION SHEET (Continuation Sheet)

5. Licensing Basis Satisfaction (continued)

#### B. Final

Black & Veatch finding; again this difference is due primarily to the added light-weight filler material of the round cable. However, the average cable routed in control level trays is 5-conductor. Therefore, for a given control level tray, multi-conductor control cables may vary from a 2-conductor through a 19-conductor configuration.

Although TVA used nominal OD in calculating the cross-sectional area of the cable for tray loading purposes, the nominal OD may vary only a few thousandths of an inch compared to a respective cable vendor data. Even if these variances do result in a cross-sectional loading slightly above 60 percent fill for control and instrumentation cable trays, there is no effect on cable empacity. For power cables, the copper cross-sectional area is not increased by any increase of cross-sectional area of the finished cable assembly, due to increased insulation/jacket thicknesses. The adequacy of the current carrying capability and ampacity derating of power cables, when routed in trays, is considered by the cable designer when he sizes the cable for its application, including short circuit handling capability. For example, power cables for motor circuits are conservatively sized for 125 percent of motor ratings. Thus, adequate cable ampacity exists for power cables in trays which have a 30-percent fill by cross-sectional area.

- 3. Any minute differences in nominal cable ODs versus actual ODs have no impact on either the cable tray support system or the fire hazards analysis. The dead weight loading of cables, cable trays and fittings, and applicable cable coating used a conservative composite weight of 45 lbs/ft of tray (for 18-inch width) in the development of criteria for the cable tray support system. The composite weight and combustible loading are based on trays being 100 percent fill.
- 4. For the type of cables used, the insulations and jackets have a range of combustibles from 6000 to 14,000 BTUs/lb. The fire hazards analysis utilized a conservative 14,000 BTUs/lb fire loading of combustible cable material where cable trays occur. Horeover, the applied cable coating reduces the ignitibility and combustibility of the insulation/jacket material. In addition, where more than 120,000 BTUs/sq ft of installed combustibles exist in safety-related areas, a fixed suppression system is installed.

From this evaluation, minor variations in actual cable tray fill have no effect on cable empacities, on the support system, or on the fire protection system. Therefore, TVA's position is that the installation is satisfactory and complies with FSAR requirements.

EVALUATION SHEET

Rav. R1 Date 2/28/8

- i. Task Force Category 37 for Watts Bar Nuclear Plant Unit 1
- 2. Task Force Category Description and Related B&V Findings: Valve wiring circuits are designed such that the red and green indicating lights on the unit control board will light dimly upon malfunction of the P-suco contact of the Westinghouse W-2 control switch on the unit control board: F112
- 3. Evaluation for Cause
  - A. Preliminary
    - -Inadequate recognition of need to design circuits that do not rely on a situation that the operator must make a judgement of lamp brightness to determine equipment condition.
    - -Inadequate design checking/verification during circuit design process to allow "sneak circuit" condition to exist.
  - B. Final

    The need to design circuits that do not rely on operator judgment of lomp brightness to determine equipment status was recognized and design proceeded accordingly. However, the identified failure was the result of a single random design error in conjunction with inadequate design checking/verification during circuit design process.

Resp. Org. MRR elem 2/19/84 Task Force Concurrence ZE9/84

- 4. Evaluation for Generic Examples
  - A. Preliminary
    Problem is generic to valve wiring circuits containing Westinghouse W-2 switches
    throughout WBN unit 1.
  - B. Final

Concur.

Resp. Org. 9 RR. Reluc 2/29/84 Task Force Concurrence ZZ ZZ 7/84

- 5. Licensing Basis Satisfaction
  - A. Preliminary
    Not satisfied for safety systems identified in FSAR Section 7. Satisfied for all other systems.
  - B. Final

Licensing basis was not satisfied for safety systems. ECN 4591 will correct this condition.

Resp. Org. MRR. 2 /27/80 Task Force Concurrence 28 2 127/84

- 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work
  - A. Preliminary
    Task force is not aware of any action.
  - B. Final

Concur.

Resp. Org. MRB. Law 2/29/84 Task Force Concurrence

2/184

- 7A. Identification of Corrective Action for Completed Work
  - A. Preliminary
    All safety system valve circuits need to be reviewed and revised to eliminate the identified "sneak circuit."
  - B. Final

All safety system valve circuits have been reviewed to determine which circuits contain the identified "sneak circuits." 'The design for these is being revised.

Resp. Org. 911 A Below 2/29/84 Task Force Concurrence 2

- 8A. Implementation and Inspection of Corrective Action for Completed Work
  - A. Preliminary" .
  - B. Final

Implementation and inspection of corrective action for completed work will be accomplished prior to unit I fuel load by ECN 4591.

Resp. Org. MRBeles 2/29/84 Task Force Concurrence 28 2 29/84

- 9A. Identification and Evaluation of Ongoing Corrective Action for Future Work
  - A. Preliminary Task force knows of no ongoing programmatic corrective action.
  - B. Final

Concur.

Resp. Org. MR Belue 2/24/84 Task Force Concurrence 211 2 27/84

- 10A. Identification of Corrective Action for Future Work
  - A. Preliminary Must be determined by evaluation of cause(s).
  - The identified failure was the result of a single random design error. All designers are aware of the potential for this type of error, particularly during design of circuit modifications, and strive to avoid these errors. No corrective action for future work will be required.

Resp. Org. MRB Lev 2/27/84 Task Force Concurrence

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| lA. Implementation | m of Corrective Action for Future Work                 |                                       |
| A. Prelimina       | ry                                                     |                                       |
| N/A                | w v                                                    |                                       |
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| B. Final           |                                                        |                                       |
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| A. Verification    | of Effectiveness of Corrective Action for Future Work  |                                       |
| Å. Preliminar      |                                                        |                                       |
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| B. Identification  | n and Evaluation of Ongoing Corrective Action for Comp | leted Work                            |
| A. Preliminar      | ry                                                     | •                                     |
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| N/A                |                                                        |                                       |
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| 73. | Identification of Corrective Action for Completed Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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|     | A. Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|     | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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|     | B. Finel                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| В.  | Laplementation and Inspection of Corrective Action for Completed Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|     | A. Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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|     | B. Final                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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|     | Resp. Org. // Task Force Concurrence //                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| B.  | Identification and Evaluation of Ongoing Corrective Action for Future Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|     | A. Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|     | M/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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|     | B. Final                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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|     | Resp. Org. // Task Force Concurrence //                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

| 103. | Identification of Corrective    | Action for Future Work               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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|      | A. Preliminary                  |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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|      | B. Finel                        |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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|      | Implementation of Corrective    | Action for Future Work               | ٠                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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|      | B. Finel                        |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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|      | Resp. Org.                      | Task Force Concurrence               | / / .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 2В.  | Verification of Effectiveness   | of Corrective Action for Future Work |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|      | A. Preliminary                  |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|      | N/A                             | ·                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| į    | B. Final                        |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| 1    | Resp. Org.                      | Task Force Concurrence               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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EVALUATION SHEET

Rev. <u>82</u> Date 12/19/83

- 1. Task Force Category 38 for Watts Bar Nuclear Plant Unit 1
- 2. Task Force Category Description and Related B&V Findings:

Evaluation to determine if design of thermal overload bypass circuits met requirements of commitments to EG 1.106 and IEEE 279-1971: F108 and F122.

- 3. Evaluation for Cause
  - A. Preliminary

After the evaluation in Step 5, the cause(s) will have to be determined if the licensing basis is not satisfied.

B. Final

Licensing basis is satisfied. See Item 5 for justification.

Resp. Org. OR 144163 Task Force Concurrence 2113184

- 4. Evaluation for Generic Examples
  - A. Preliminary

After completion of Step 5, this will be evaluated for generic examples if the licensing basis is not satisfied.

B. Final

The condition is generic for Watts Bar Units 1 and 2 motor-operated valves.

Resp. Org. M. Full 12/183 Task Force Concurrence 2/13/84

## 5. Licensing Basis Satisfaction

A. Preliminary
WBN MOV thermal overload bypass design needs to be investigated for: (1)
Capability for "... testing and calibrating channels, and the device unit to
drive the final system output signal from the various channel signals, ..." as
required by IEEE 279-1971 (Section 4.10), and (2) Reasons for the BLM thermal
overload bypass circuit design philosophy differing from that used at BFM, SQB,
and WBM.

B. Final

See continuation sheet for justification.

Resp. Org. 12/24/89 Task Force Concurrence 2/13/84

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

Task force is not aware of any corrective action.

B. Final

No corrective action required.

Resp. Org. 20 12/21/83 Task Force Concurrence 24/184

7A. Identification of Corrective Action for Completed Work

A. Preliminary

To be determined after evaluation in Step 5 is complete.

B. Final

Mo corrective action has been identified. However, WB-DCR-482 will be implemented for operating convenience. This modification will add one relay to each of the eight motor control centers and change wiring so that an indicator light will come on when all overload bypass relays for a given motor control center operate. The modified test circuit will also fully satisfy the requirements of RG.1-106, G.I.b, and IEEE 279, 10.0. Resp. Org.

-2-

| 84.        | Implementation  | and | Inspection | -6 | Commenting | Annin  | 4   | Complessed |      |
|------------|-----------------|-----|------------|----|------------|--------|-----|------------|------|
| <b>94.</b> | TEDICEMENTALION | 802 | TESPECTION | 10 | COTTECTIVA | Action | for | Completed  | Hork |

A. Preliminary

N/A

B. Final

H/A

Resp. Org. D. D. College / 187 Task Force Concurrence 25 188

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

Task force knows of no ongoing programmatic corrective action.

B. Final

The modified test circuit will be included with any motor operated valve overload relay bypass circuits added at Watts Bar Nuclear Plant in the future.

Resp. Org. M. Lulle 12/24/83 Task Force Concurrence 2

10A. Identification of Corrective Action for Future Work

A. Preliminary

To be determined if evaluation in Step 5 shows the licensing basis is not satisfied.

B. Final

H/A

Resp. Org. D.M. 12 /21 /83 Task Force Concurrence 24/13 /89

| liA. Implementation of Corrective Action for Future Work                  |           |
|---------------------------------------------------------------------------|-----------|
| A. Preliminary                                                            | •         |
| No corrective action required.                                            |           |
|                                                                           |           |
|                                                                           |           |
| 3. Final                                                                  |           |
| No corrective action required.                                            |           |
|                                                                           |           |
| Resp. Org. Dec. 14/83 Task Force Concurrence                              | / 13 184  |
| 2A. Verification of Effectiveness of Corrective Action for Future Work    |           |
| A. Preliminary                                                            |           |
| No corrective action required.                                            |           |
|                                                                           |           |
|                                                                           | •         |
| 5. Final                                                                  |           |
|                                                                           | •         |
|                                                                           |           |
| Resp. Org. 12 /51 /83 Task Force Concurrence                              |           |
| 6B. Identification and Evaluation of Ongoing Corrective Action for Comple |           |
| A. Preliminary                                                            | stee work |
| H/A                                                                       |           |
|                                                                           |           |
|                                                                           | •         |
| 8. Final                                                                  | •         |
|                                                                           |           |
|                                                                           |           |
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| Resp. Org. Jan Jan 12/11/83 Task Force Concurrence                        |           |

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| 7B. Identification of Corrective Action for Completed Work             |          |
|------------------------------------------------------------------------|----------|
| A. Preliminary                                                         |          |
|                                                                        | •        |
|                                                                        |          |
|                                                                        |          |
| 3. Final                                                               | •        |
|                                                                        |          |
|                                                                        |          |
| Resp. Org. Don Class 12/24/83 Task Force Concurrence                   |          |
| Resp. Org. 107 half 12/34/83 Task Force Concurrence                    |          |
| 8B. Implementation and Inspection of Corrective Action for Completed b | iork     |
| A. Preliminary                                                         |          |
| M/A                                                                    |          |
|                                                                        |          |
|                                                                        |          |
| B. Final                                                               |          |
|                                                                        |          |
|                                                                        |          |
| Resp. Org. Della 2/4/83 Task Force Concurrence                         | , ,      |
| O TOTAL POLCE CONCURRENCE                                              |          |
| 9B. Identification and Evaluation of Ongoing Corrective Action for Fut | ure Work |
| A. Preliminary                                                         |          |
| B/A                                                                    |          |
| •                                                                      |          |
|                                                                        |          |
| B. Final                                                               |          |
|                                                                        |          |
|                                                                        |          |
| Resp. Org. 12/2/83 Task Force Concurrence                              |          |
| TASK FORCE CONCURRENCE                                                 |          |

| 103. | Identification of Corrective Action for Future Work                |
|------|--------------------------------------------------------------------|
|      | A. Preliminary                                                     |
|      | <b>3</b> / <b>△</b>                                                |
|      |                                                                    |
|      |                                                                    |
|      | S. Final                                                           |
|      |                                                                    |
|      |                                                                    |
|      | Resp. Org. on Sala 12/21/83 Task Force Concurrence                 |
|      | 0                                                                  |
| 118. | Implementation of Corrective Action for Future Work                |
|      | A. Preliminary                                                     |
|      | B/A                                                                |
|      |                                                                    |
|      | B. Finel                                                           |
|      | D. Final                                                           |
|      |                                                                    |
|      |                                                                    |
| 1    | Resp. Org. DON Land 12/24/85 Task Force Concurrence                |
|      | S .                                                                |
|      | Verification of Effectiveness of Corrective Action for Future Work |
| 4    | A. Preliminary                                                     |
|      | ₩/A                                                                |
|      |                                                                    |
| 1    | 3. Final                                                           |
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### BLACE & VEATCH EVALUATION SHRET (Continuation Sheet)

- 5. Licensing Basis Satisfaction
  - B. Final
- (1) MG 1.106 (Thermal Overload Protection for Electric Motors on Motor-Operated Valves), identifies the criterion for thermal overload protection devices that are integral with the motor starter for electric motors on motor-operated valves. MG 1.106 also describes three methods that are acceptable to the Muclear Regulatory Commission staff for complying with the identified criterion. The method described in Position C.1.b requires that those thermal overload protection devices that are normally in force during plant operation should be bypassed under accident conditions. This position has been implemented at Watts Bar and Bellefonte Huclear Plants. Regulatory Position C.1 also requires that the bypass system circuitry conform to certain sections of IEEE 279. IEEE 279 Section 4.10 requires that devices used to derive the final system output signal be tested. These devices are the relays that actually perform the overload bypass. At Watts Bar Nuclear Plant, the testing of these devices is accomplished by pushing a test button at each motor control center, and observing that the relay for each individual valve operates. The relay operation is verified by checking to see if the relay indicator window, located on the side of the relay, changed state. The Regulatory Position also requires that the bypass system circuitry conform to Section 4.13 of IEEE 279. IEEE 279 Section 4.13 requires that a continuous indication of bypass be in the main control room if the protective action or some part of the system has been bypassed or deliberately rendered inoperative for any purpose. This section does not apply since no part of the protective action is bypassed during the test. Indication is provided in the main control room that the overload bypass signal has been initiated. The method of testing described above is acceptable for this application because it verifies relay operation by observation of a positive action. The licensing basis is satisfied in that the thermal overload bypass can be tested using one operator to initiate the test and a second operator some distance away to verify mechanical operation of the relay.
- (2) A test circuit modification to improve operating flexibility and convenience has been approved by EM DES. See design change request WB-DCR-482 (DES 830701 009); M. M. Sprouse to H. S. Green, September 21, 1983 (WBP 830921 056); and H. J. Green to M. M. Sprouse, Hovember 30, 1983 (DES 831201 012). When implemented, it will be possible for the operator initiating the test to determine that all bypass relays for a motor control center have operated by observing one test light.
- (3) At Bellefonte Muclear Plant, the testing of the overload bypass is accomplished by pushing a test button at each motor control center, and observing that an indicator light came on. This indicator light is wired up such that each overload bypass relay would have to operate before the light would come on. This also satisifies Regulatory Position identified in RG 1.106 and IEEE 279 Section 4.10. IEEE 279 Section 4.13 does not apply for the same reason given in 5.8(1). RG 1.106 came into effect at different construction phases of TVA's various nuclear plants. It is not a requirement that all TVA's nuclear plants be identical. In fact, different design organizations are performing the detail design for each plant and such things as expense and equipment availability are weighed heavier than making all plants identical.

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EVALUATION SHEET

Rev. <u>R2</u> Date <u>3/1/H4</u>

- 1. Task Force Category 39 for Watts Bar Nuclear Plant Unit 1
- 2. Task Force Category Description and Related B&V Findings:

The specific configuration of 6.9-kV bundled cables in trays has not been tested for the effects of fire retardant coating on the ampacity of the cable: G901

- 3. Evaluation for Cause
  - A. Preliminary

TVA considered the tests performed to determine fire retardant coatings' effect on ampacity of cables to adequately justify not derating cables due to fire retardant coatings. Determination of cause(s) will be done if evaluation in step 5 shows licensing basis is not satisfied.

B. Final

Refer to 5.A.B. Licensing Basis Satisfaction.

Resp. Org. A.L. Suralland #/10/83 Task Porce Concurrence

- 4. Evaluation for Generic Examples
  - A. Preliminary

This finding indicates that other similar examples exist.

B. Final

N/A

Resp. Org. R.L. Swallow 11/10/33 Task Force Concurrence

| 5. | Licensine | Beei - | Satisfaction |
|----|-----------|--------|--------------|
|    | PTCAMBTUE |        | SACISTACTION |

A. Preliminary

Licensing basis satisfaction needs to be determined by evaluating the effects of the fire retardant coating on the ampacity of the 6.9-kV cables when the cables are bundled together in trays.

B. Final

See Continuation Sheet (page 7).

C. N. Sullath 3-2-84

Resp. Org. R.L. Swellows 11/10/43

Resp. Org. R.L. Swellows 11/10/43

Resp. Org. R.L. Swellows 11/10/43

Task Force Concurrence

- 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work
  - A. Preliminary

Task force is not aware of any corrective action.

B. Final

N/A

Resp. Org. B.L. Swellow 11 /10/33 Task Force Concurrence

- 7A. Identification of Corrective Action for Completed Work
  - A. Preliminary

If evaluation in step 5 shows the licensing basis is not satisfied, corrective action will be determined.

B. Final

N/A

Resp. Org. R.4. 5. -- 11/10/83 Task Force Concurrence 11/4/83

| 84.                                                                            | Leq       | plementation and Inspection of Corrective Action for Completed Work |             |  |
|--------------------------------------------------------------------------------|-----------|---------------------------------------------------------------------|-------------|--|
|                                                                                | A.        | Preliminary                                                         |             |  |
|                                                                                |           |                                                                     |             |  |
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|                                                                                | в.        | Final                                                               |             |  |
|                                                                                |           | N/A                                                                 |             |  |
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|                                                                                | Res       | ip. Org.R.L.Supline 11/10/43 Task Force Concurrence                 | 78          |  |
| 9A. Identification and Evaluation of Ongoing Corrective Action for Puture Work |           |                                                                     |             |  |
|                                                                                |           | Preliminary                                                         |             |  |
|                                                                                |           |                                                                     |             |  |
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|                                                                                | <b>B.</b> | Final                                                               |             |  |
|                                                                                |           | N/A                                                                 |             |  |
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| <del>-</del>                                                                   | Res       | p. Org. R.L. S. allow 11/10/93 Task Force Concurrence               | / <b>13</b> |  |
| 0A.                                                                            | Ide       | ntification of Corrective Action for Future Work                    |             |  |
|                                                                                | A.        | Preliminary                                                         |             |  |
|                                                                                |           |                                                                     |             |  |
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|                                                                                | В.        | Final                                                               |             |  |
|                                                                                |           | N/A                                                                 |             |  |
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Resp. Org. P.L Sand 11 /10 /93 Task Force Concurrence

| 11A. Implementation of  | Corrective Action for F  | uture Work             |                |
|-------------------------|--------------------------|------------------------|----------------|
| A. Preliminary          | •                        |                        |                |
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|                         | ·                        |                        |                |
| B. Final                |                          |                        |                |
| NIA                     |                          |                        |                |
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| Resp. Org. R.L. Swall   | Men 11/10/83 Task        | Force Concurrence      | 11 11 8        |
|                         |                          |                        |                |
| 2A. Verification of Eff | ectiveness of Corrective | ve Action for Future W | ork .          |
| A. Preliminary          | •                        |                        |                |
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| B. Final                |                          |                        |                |
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| B. Identification and 1 | Evaluation of Ongoing C  | orrective Action for   | Completed Work |
| A. Preliminary          |                          |                        |                |
|                         |                          |                        |                |
| n/a                     | ,                        | •                      | •              |
| N/A                     |                          |                        |                |
| n/A                     |                          | •                      |                |
| N/A B. Finel            |                          |                        |                |
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| B. Finel                | -                        |                        |                |

Arthur Ma

| A. Preliminary      | of Corrective Action for Completed Work          |            |
|---------------------|--------------------------------------------------|------------|
| N/A                 |                                                  |            |
| N/A                 |                                                  |            |
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| B. Final            |                                                  |            |
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| . Implementation an | nd Inspection of Corrective Action for Completed |            |
| A. Preliminary      |                                                  | WOTE       |
| N/A                 |                                                  |            |
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| B. Final            |                                                  | •          |
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| Identification an   | d Evaluation of Ongoing Corrective Action for Fo | uture Work |
| A. Preliminary      | •                                                |            |
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|                       | f Corrective Action for Future Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |
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| B. Implementation of  | f Corrective Action for Puture Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |
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| B. Verification of E  | ffectiveness of Corrective Action for Future Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <del></del> |
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#### BLACK & VEATCH EVALUATION SHEET (Continuation Sheet)

# 5. Licensing Basis Satisfaction

#### B. Final

The licensing basis is satisfied because there is no significant effect on cable ampacity of installed 6.9-kV bundled 3-phase cables due to applied cable coating. An independent test showed that tightly packed power cables coated with Vimesco allows heat transfer just as good as air.

For short circuit ratings, TVA uses a minimum 2/0 AMG cable size for shielded power cable applications (6.9-kV service at WBM), which is conservative from an ampacity viewpoint. When routed in cable trays, these 2/0 AMG cables may be installed random lay (side-by-side with no space between cables). Shielded power cables larger than 2/0 AMG (4/0 AMG through 500 MCM) are grouped as 3-phase "seders and stacked in pyramids and separated from other grouped cable bundles by a nominal distance equal to the radius of the largest cable. A typical worst case arrangement of these cables is shown in Detail B of Figure 1. This spacing is provided to minimize the induced electro-motive forces (EMF) between phases when the cables are under load, and it does provide a more conservative design to more readily allow produced heat to be dissipated. However, the minimum spacing between cable bundles may be less where cables enter or exit the tray and at tray fittings, such as tees and crosses (i.e., the cable bundles may be in contact with each other).

The ampacities of shielded power cables installed in cable trays are determined from Electrical Design Standard DS-El2.1.2 for 90°C maximum copper conductor temperature in a 40°C ambient. The ampacity values for these cables given in DS-El2.1.2 are more conservative than the 80 percent factor suggested in ICEA 3-54-440 for converting ampacities of cables in free air to cable trays. The cable designer considers ampacity derating of power cables when he sizes the cable for its application, including short circuit handling capability and to maintain suitable voltage regulation. In addition, motor circuits are conservatively sized for 125 percent of motor ratings.

Where cable coating is required to meet fire protection requirements, it is TVA practice to coat exposed surfaces of cables including the spaces between bundles of shielded power cables. The coating is applied to a nominal 3/16-inch + 1/16-inch wet thickness. With reference to Detail B of Figure 1, it should be noted that the coating itself between cable bundles is not a heat source; instead the coating is an excellent conductor of heat, based on independent laboratory tests.

Testing performed for Vimasco by the Factory Mutual Research (FM) (Report No. J.I. 0F0Q5.AF) concluded that with two wet coat thicknesses of 1/8-inch each (1/4-inch maximum thickness which is upper limit of TVA design), applied sequentially between tests, the ampacity decreased only by 1.62

BLACK & VEATCH EVALUATION SHEET (Continuation Sheet)

5. Licensing Basis Satisfaction (continued)

#### B. Final

percent, which TVA considers insignificant. The FM tests were performed on power cables arranged in cable trays, uniformly stacked three cables deep, as shown in Detail A of Figure 1. The intent of the cable arrangement was to simulate a 40 percent tray fill (the actual fill was 43 percent) and to have all cables (except the ones located in the corners of the tray) touch other cables on at least three sides. This arrangement essentially eliminates air paths (convection) between the conductors and causes an opposite effect in that there is one heat source surrounded by other adjacent heat sources. For this reason, the tests as performed represent a worst case situation. The 2/0 AMG cables shown in Detail B of Figure 1, represent the same configuration as that tested, in that cables touch each other. The majority of the cables are 2/0 AWG for 6.9-kV service. Again, the coated 3-cable bundles do not touch, except as described above, and the coating provides a conductive path for heat dissipation. Furthermore, the test shows the heat transfer between the tightly packed cables coated with Vimasco and air paths is so good that the coating need not be considered in the design of the cable system.

Based on the above evaluation, TVA concludes that the installed cable configuration, including cable coating, requires no further derating of the cable bundles, and it satisfies the licensing basis.

March 1, 1984 - Nonconformance WBNEEB 8401R2 (EEB 840214 918) identified a significant condition in which documentation was not available to show that Class 1E 6900-volt cable will not exceed its rated maximum continuous copper temperature of 90°C when installed in cable trays and covered with flame retardant coating.

A study (EEB 840203 901) was performed which showed that adequate ampacity exists for cables after derating for the cable coating. Therefore, the licensing bases is satisified.

Conductive heat transfer path
only, no convective path
— Cable tray

Cable coating (cocoon coating of cables)

Mockup Arrangement For Joslyn Research Center Ampacity Test On Coated Cables

DETAIL A

Cable bundles > than % AWG

Conductive path;

no heat source, typical

Cable tray

Cable tray

Cable coating on exposed

Surfaces of cables

 $A = \frac{d_1}{2}$  or  $\frac{d_2}{2}$ , whichever is larger  $B = \frac{d_2}{2}$  or  $\frac{d_3}{2}$ , whichever is larger  $C = \frac{d_3}{2}$ 

Typical Worst Case Arrangement Of Coated Medium-Voltage (5 KV) Power Cables Installed At Browns Ferry Nuclear Plant

DETAIL B

Figure 1
Typical Arrangement Of
Insulated Power Cables
Coated With Flamemastic 77

8 & V (G901) TF Cat. 39

EVALUATION SHEET

Rev. Date 3/13/82

- 1. Task Force Category 3 for Watts Bar Nuclear Plant Unit 2
- 2. Task Force Category Description and Related Watts Bar Nuclear Plant unit 1 B&V Findings: Logic/control drawings do not agree with electrical drawings: F101, F102, F103, F104, F105, F106, F107, F110, F111, F114, F115, F116, F117, F123, F124, F127, F129, F130, F131, F141, F802, F803, F804, F805, F806.
- 3. Evaluation for Cause
  - A. Preliminary

Watts Bar unit 1:

- Inadequate drawings/checking of drawings prior to issue.
- Inadequate recognition of need to revise companion drawings during design change process.

Watts Bar unit 2:

- These causes appear to be applicable to Watts Bar unit 2.
- B. Final

Pailure to consistently implement design review procedures as required in EN DES engineering procedure EP 4.25, "Design Review and Interface Coordination of Detailed Construction and Procurement Drawings.

Resp. Org. (AMICED 3 1/4/04 Task Force Concurrence

- 4. Evaluation for Generic Examples
  - A. Preliminary

Problem is generic to logic, control, schematic, and connection drawings throughout WBN Unit 2.

B. Final - To determine generic implications, WBP reviewed the component cooling (70), containment spray (72), and residual heat removal systems (74) to identify mismatches in the logic, schematic, and connection diagrams for those systems. WBP then evaluated the seriousness and important of each mismatch and of the aggregate. Based upon this review, WBP concluded that the present TVA design for all safety systems is fully adequate for correct installation and operation of Watts Bar Nuclear Plant, with two exceptions: (1) instantaneous trip settings of molded case circuit breakers, (2) functional errors on logic diagrams. See Continuation Sheet (page 7).

Resp. Org. Land 3 W104 Task Force Concurrence

- 5. Licensing Basis Satisfaction
  - A. Preliminary

Not satisfied for unit 1 safety systems identified in FSAR section 7 but satisfied for all other systems. This would also apply to the unit 2 licensing basis.

B. Final - FSAR Section 7 identifies functional safety requirements for all safety systems. The licensing bases was not violated for any of the identified Black and Veatch findings in this category. However, the expanded, three system review described in Section 4 revealed licensing problems in two areas: (1) licensing basis was not satisfied for instantaneous trip settings for molded case circuit breakers, (2) licensing commitments were not satisfied for logic diagram functional requirements.

Resp. Org. Common 3/14/44 Task Force Concurrence 2/6 3 V6/84

- 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work
  - A. Preliminary
    NCR SWP 8267 written on unit 1 (currently nonsignificant) and ECM 3683 only
    address correction of B&V identified drawing errors in the auxiliary feedwater
    system. TVA's Level 1 response to B&V finding F101 does not address all the
    effects of the existence of inaccurate drawings during design, construction, and
    operation. Task force is not aware of any ongoing corrective action on unit 2.
  - B. Final

No ongoing corrective action was in place at the time of the Black and Veatch review.

Resp. Org. Grant 3 V4 64 Task Force Concurrence 246 3 V6 184

- 7A. Identification of Corrective Action for Completed Work
  - A. Preliminary

All safety system logic, control, schematic, and connection diagrams need to be reviewed and revised to be consistent with design criteria and each other. As discrepancies are corrected, the impact on internal safety analyses and previous licensing submittals must also be evaluated.

B. Final - WBP initiated the following ECNs to incorporate corrective actions for the findings identified in this category: 3647, 3650, 2816 and 3683. The following FCRs were also accepted from CONST: E3458 and E3508. Additionally, WBP initiated ECNs 4358 and 4360 to correct findings identified in the expanded, three safety review addressed in Section 4. ECN 4667 has been issued to correct logic diagram errors identified in the FSAR logic review, also dexscribed in Section 4, to be completed by March 30, 1984.

Resp. Org. Concurrence 31/6184

- 8A. Implementation and Inspection of Corrective Action for Completed Work
  - A. Preliminary
  - B. Final FCR E3458 Completed (SWP 830125 153); FCR E3508 Completed (SWP 830217 101); ECN 2816 Completed Closure Sheet 95 (SWP 830203 019); ECN 3334 Completed Closure Sheet 101 (WBP 830624 027); ECN 3647 Completed Closure Sheet 103 (WBP 830829 014); ECN 3650 Completed Closure Sheet 103 (WBP 830829 014); ECN 3663 Completed Closure Sheet 101 (WBP 830624 027); ECN 4358 Completed; ECN 4360 Completed Closure Sheet 118 (WBP 840123 507); ECN 4246 Completed Closure Sheet 112 (WBP 831114 521); ECN 4358 Completed; ECN 4360 Completed Closure Sheet 118 (WBP 840123 507); ECN 4246 Completed Closure Sheet 118 (WBP 840123 507); ECN 4246 Completed Closure Sheet 118 (WBP 840123 507); ECN 4246 Completed Closure Sheet 118 (WBP 840123 507); ECN 4246 Completed Closure Sheet 112 (WBP 831114 521); ECN 4667 issued.

Resp. Org. Ames Pp 3W104 Task Force Concurrence 3W184

- 9A. Identification and Evaluation of Ongoing Corrective Action for Future Work
  - A. Preliminary

Task force knows of no ongoing programmatic corrective action.

B. Final

Resp. Org. Lesson 3/16/69 Task Force Concurrence 3/16/84

10A. Identification of Corrective Action for Future Work

A. Preliminary

Must be determined by evaluation of cause(s).

B. Final Implementation of engineering procedures training and utilization program initiated by M. N. Sprouse to Those listed dated February 26, 1982 (NEB 820226 255).

Resp. Org. Concorpy 3/14/09 Task Force Concurrence 3/16/84

| 11 <b>A.</b> | Implementation of Corrective Action for Future Work                           |
|--------------|-------------------------------------------------------------------------------|
|              | A. Preliminary                                                                |
|              |                                                                               |
|              |                                                                               |
|              | 3. Final                                                                      |
|              |                                                                               |
|              | Training in EN DES EP 4.25 completed on July 28, 1982, for I&C Section.       |
|              |                                                                               |
|              | Resp. Org. Grand 3/1/04 Task Force Concurrence 74 3/6/89                      |
| 2 <b>A.</b>  | Verification of Effectiveness of Corrective Action for Future Work            |
|              | A. Preliminary                                                                |
|              |                                                                               |
|              |                                                                               |
|              |                                                                               |
|              | B. Final                                                                      |
|              |                                                                               |
|              |                                                                               |
|              | Resp. Org. // Task Force Concurrence //                                       |
| B.           | Identification and Evaluation of Ongoing Corrective Action for Completed Work |
|              | A. Preliminary                                                                |
|              | No viable ongoing corrective action for nonsafety systems.                    |
|              |                                                                               |
|              |                                                                               |
| 1            | 3. Final                                                                      |
|              | NA                                                                            |
|              |                                                                               |
|              | esp. Org. // Task Force Concurrence //                                        |

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| 78. Ide | Mifiguries of Commonly Land                                                                                                                        |                      |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
|         | ntification of Corrective Action for Completed Work                                                                                                |                      |
| ۸.      | Preliminary                                                                                                                                        |                      |
|         | Corrective action should address all nonsafety systems and should con a priority based upon system importance to nuclear safety and ploperability. | orrect drawin<br>ant |
| 3.      | Final                                                                                                                                              |                      |
|         | N:A                                                                                                                                                |                      |
|         |                                                                                                                                                    | •                    |
|         |                                                                                                                                                    |                      |
| Res     | o. Org. / / Task Force Concurrence                                                                                                                 |                      |
| 8B. Imp | lementation and Inspection of Corrective Action for Completed Work                                                                                 |                      |
|         | Preliminary                                                                                                                                        |                      |
|         |                                                                                                                                                    |                      |
| •       |                                                                                                                                                    |                      |
|         |                                                                                                                                                    |                      |
| В.      | Final                                                                                                                                              |                      |
|         | NA                                                                                                                                                 |                      |
|         |                                                                                                                                                    |                      |
|         |                                                                                                                                                    |                      |
| Resp    | . Org/ Task Force Concurrence                                                                                                                      | , ,                  |
| B *4-   |                                                                                                                                                    |                      |
| , rden  | tification and Evaluation of Ongoing Corrective Action for Future Wo                                                                               | rk                   |
| A       | Preliminary                                                                                                                                        |                      |
|         |                                                                                                                                                    |                      |
|         |                                                                                                                                                    | •                    |
| В. 1    | Final                                                                                                                                              |                      |
|         |                                                                                                                                                    |                      |
| /       | N'A                                                                                                                                                |                      |
|         |                                                                                                                                                    |                      |
| Resp.   | Org. / / m                                                                                                                                         |                      |
|         | Org. / / Task Force Concurrence                                                                                                                    | / /                  |

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|-------------------------------------------------------------------------|-----|
| 10B. Identification of Corrective Action for Future Work                |     |
| A. Preliminary                                                          |     |
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|                                                                         |     |
|                                                                         |     |
| B. Final                                                                |     |
| NA                                                                      |     |
|                                                                         |     |
| Resp. Org/ Task Force Concurrence                                       | , , |
|                                                                         |     |
| 11B. Implementation of Corrective Action for Future Work                |     |
| A. Preliminary                                                          |     |
|                                                                         |     |
|                                                                         |     |
| B. Final                                                                |     |
| NA                                                                      |     |
|                                                                         | •   |
| Page Aug                                                                |     |
| Resp. Org. // Task Force Concurrence                                    |     |
| 12B. Verification of Effectiveness of Corrective Action for Future Work |     |
| A. Preliminary                                                          |     |
|                                                                         |     |
|                                                                         |     |
| B. Final                                                                |     |
|                                                                         |     |
| NA .                                                                    |     |
|                                                                         |     |
| Resp. Org. / / Task Force Concurrence                                   | , , |
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## BLACK & VEATCH EVALUATION SHEET (Continuation Sheet)

- 4. Evaluation of Generic Examples
  - B. Final (Continued)

WBP has previously addressed instantaneous trip settings on Black and Veatch category 35, including all generic examples and corrective actions. WBP is presently checking all logic diagrams contained in the WBMP FSAR against the appropriate schematic diagrams to identify any additional functional mismatches. This review will be completed by March 30, 1984.

EVALUATION SHEET

Rev. R3 Date 3/9/84

- 1. Task Force Category 4 for Watts Bar Nuclear Plant Unit 2
- Task Force Category Description and Related Watts Bar Nuclear Plant unit 1 B&V Findings:

Failure to design/maintain design records for AFW system as specifically described in the FSAR: F118, F121, F303, F304, F305, F306, F309, F313, F502, F504, F511, F513.

- 3. Evaluation for Cause
  - A. Preliminary

Watts Bar unit 1:

- The design control process was not closely linked to FSAR commitments. Watts Bar unit 2:
- This cause appears to be applicable to Watts Bar unit 2.
- B. Final TVA personnel involved in the design process on Watts Bar were not (in all instances) aware of the statements in the FSAR that describe various aspects of the plant's design for which they were responsible. Subsequently, as the Watts Bar design (and concurrent design documentation) evolved, changes in TVA's design (both in design philosophy and physical layout) have not been uniformly reflected in the FSAR via amendments to the docketed description. This assessment is applicable to both units at Watts Bar.

Resp. Org. Halla: 3/16/84 Task Force Concurrence 3/1/84

- 4. Evaluation for Generic Examples
  - A. Preliminary

Given the cause and the base of findings, the situation does not lend itself to a sample approach for bounding the problem to the unit 1 AFW system.

B. Final - B&V findings in this category deal primarily with discrepancies in documentation (actual versus FSAR-described) on the civil engineering design aspects of the Watts Bar AFW system. However, the discrepancies do involve other engineering disciplines (besides civil) and are of a nature such that they could not be described as documentation problems associated only with the AFW system. Therefore, additional sampling of the FSAR statements would not provide an accurate assessment of the scope of discrepancies. This assessment is applicable to both units at Watts Bar.

to both units at Yatts Bar.

Resp. Org. LHChi. 3/16/F/L Task Force Concurrence

- 5. Licensing Basis Satisfaction
  - A. Preliminary

For all examples the unit 2 as well as the unit 1 licensing basis is not satisfied even though there may be no safety significance.

B. Final
Certain findings in this category—F303, F304, F305, F306, F309 and F313—(i.e., location of design documentation) would not impact the licensing basis for Watts Bar. However, other findings—F118, F121, F502, F504, F511 and F513—which involve the application of design/analysis techniques different from that described in the FSAR do not appear to satisfy the plant's licensing basis. This assessment is applicable to both units at Watts Bar.

Resp. Org. Alle 31618 Task Force Concurrence 21/6 319184

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary
Memoranda NEB 821116 265 and NEB 830117 256 represent a valid FSAR correction process
relative to assignment of scope, responsibilities, and timeliness. The criteria for
the actual review are not identified and therefore cannot be determined to be
effective in finding and correcting problems similar to those identified by B&V. The
plan also needs to provide for accountability below the branch chief level.
B. Final

See continuation sheet (page 7)

Resp. Org. LHOh. 3/484 Task Force Concurrence 11/184

- 7A. Identification of Corrective Action for Completed Work
  - A. Preliminary

The plan in 6A should be issued in one document with clear criteria for assessment with respect to either a date or revision level applicable.

B. Final

See continuation sheet (page 7)

Resp. Org. Lifehe 316164 Task Force Concurrence 118 317184

| 84. | Implementation | and Inspect | ion of Cor | Pacting Acet | <br>slaced Work |
|-----|----------------|-------------|------------|--------------|-----------------|
|     |                |             |            |              |                 |

A. Preliminary

B. Finel

EN DES-SEP 83-05, "Verification of Information Presented in Final Safety Analysis Report for Watts Bar Nuclear Plant," was issued August 17, 1983 (NEB 830818 852). This SEP describes EN DES responsibilities for performing a verification of the WBN FSAR to ensure accuracy of existing or completed work.

Resp. Org. & Telife 1 110184 Task Force Concurrence

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

Task force is not aware of any action currently directed toward this objective.

B. Final

See continuation sheet (page 7)

Resp. Org. OTCLIFF 5/2/83 Task Force Concurrence VIII 5/5/83

10A. Identification of Corrective Action for Future Work

A. Preliminary

The design control process needs to be revised to provide a positive link to maintenance of an accurate FSAR.

B. Finel

The actions described in section 9% provide the additional controls needed to more closely tie the design control process to the FSAR. This assessment is applicable to both units at Watts Bar.

Resp. Org. OTCLIF 5/2/83 Task Force Concurrence Wf 5/5/83

| <del></del> -  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11 <b>A.</b> 1 | Implementation of Corrective Action for Future Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                | . Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
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| 3              | Final                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                | All future work will be controlled by EP 2.01 R5. This revision completely upgraded the procedure for processing FSAR changes and also incorporated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                | information previously contained in EPs 2.04 and 2.05. EP 2.01 R5 was issued on December 29, 1983.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| R              | esp. Org. ATCHE 113184 Task Force Concurrence 216184                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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| 2A. V          | erification of Effectiveness of Corrective Action for Future Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                | - Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
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| B              | - Final                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| R4             | esp. Org/ Task Force Concurrence//                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 6B. I          | dentification and Evaluation of Ongoing Corrective Action for Completed Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                | Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                | W/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| в.             | Finel                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| Re             | esp. Org. / / Task Force Concurrence / /                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| B. Identification of Co | TIACTIAE WEE                            | rea tos comple | ced WOTX        |             |   |
|-------------------------|-----------------------------------------|----------------|-----------------|-------------|---|
| A. Preliminary          |                                         | •              |                 |             |   |
| H/A                     |                                         |                |                 |             |   |
|                         |                                         |                |                 |             |   |
| B. Final                |                                         |                |                 |             |   |
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| Resp. Org.              |                                         | Task Force     | Concurrence     | ····        |   |
| . Implementation and I  | epection of                             | Corrective Ace | ica for Complet |             |   |
| A. Preliminary          | • • • • • • • • • • • • • • • • • • • • |                | Ton for combine | .eu work    |   |
| H/A                     |                                         |                |                 |             |   |
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| B. Final                |                                         |                |                 |             |   |
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| Resp. Org.              | , ,                                     | _ Task Force   | Concurrence     |             |   |
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| . Identification and Ev | aluation of C                           | Dagoing Correc | tive Action for | Puture Work |   |
| A. Preliminary          |                                         |                |                 |             | • |
| M/A                     |                                         |                |                 |             |   |
|                         |                                         |                |                 | •           |   |
| B. Final                |                                         |                |                 |             |   |
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| A. Preliminary          |               | tion for Puture We | 71 B          |    |
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| B. Finel                |               |                    |               |    |
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| Resp. Org.              |               | Task Force Co      | ncurrence     |    |
| B. Implementation of C  | orrective Act | ion for Puture Wo  | rk            |    |
| A. Preliminary          |               |                    | •             |    |
| M/A                     |               |                    |               |    |
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| B. Final                |               |                    |               |    |
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| Resp. Org.              |               | Task Force Con     | currence      |    |
| B. Verification of Effe | ectiveness of | Corrective Action  | for Puture Wo | :k |
| A. Preliminary          |               |                    |               |    |
| H/A                     |               |                    |               |    |
|                         |               |                    |               |    |
| B. Final                | •             |                    |               |    |
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TVA Task Force for Review of Black & Veetch Findings

BLACK & VEATCH EVALUATION SWEET (Continuation Sheet)

64.

B. Criteria required for performing a formal review of existing FSAR material will be formally provided to the EM DES organizations responsible for validating the accuracy of this information. This criteria will be specific enough to identify discrepancies similar to the type found by Black and Veatch. Formal decumentation of the review work will be required from the responsible organizations (EO); however, accountability below the branch chief/project manager level will not be required in the formal transmittal of new/revised FSAR material to the Nuclear Engineering Support Branch's Nuclear Licensing Section (MED-NLS). Each EO will be responsible for the level of review/accountability for their particular FSAR sections. This assessment is applicable to both units at Watts Bar.

74.

B. The memorandums referenced in section 6A will be superseded by the issuance of an EE DES special engineering procedure (SEP) which will identify (a) the current status (amendment no.) of the FSAR, (b) a division of responsibility (DOR) for reviewing particular FSAR sections to verify present information and/or update as required, (c) criteria to be utilized by the EO in performing this review, and (d) dates for (i) completion of the FSAR review (ii) submittal of formal verification of existing FSAR material accuracy and new/revised FSAR descriptions (reviewed and coordinated as required by EN DES-EP 2.01) to NEE-NLS, and (iii) submittal of all new/revised FSAR material received by NEE-NLS to POWER's Buclear Licensing Staff. This assessment is applicable to both units at Watts Bar.

94.

- B. The following actions taken or to be taken provide the additional assurance required that the FSAR will be more closely linked with the design control process:
  - 1. The DOR for FSAR section being developed as part of the EH DES-SEP discussed in section 7AB will serve to make affected EN DES personnel aware of their responsibility to keep the FSAR section(s) for which they are responsible up to date. The DOR will be maintained in a current status by HEB-HLS and updated as required to reflect changes in section responsibilities and/or organizational realignments.
  - 2. EN DES-EPs 2.01, 2.04, and 2.05 are being consolidated into one EP to clarify the FSAR preparation/revision process within EN DES. When the revised EP is issued, the affected EN DES organizations will be formally notified and concurrently requested to emphasize to their employees the importance of compliance with the procedure.
  - 3. EN DES-EP 4.02 has been revised to require (a) the preparation of data sheets which describe FSAR changes needed as a result of an engineering change notice (ECH) and (b) verification that all required FSAR changes have been sent to MEB-NLS prior to reporting by EN DES that all design work on an ECN has been completed.

This assessment is applicable to both units at Watts Bar.

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R2 Date 12/27/83

- 1. Task Force Corregory 5 for Watta Bar Nuclear Plant Unit 2
- Task Force Category Description and Related Watts Bar Nuclear Plant unit 1 B&V Findings: Procurement forms and flow diagrams specified different requirements for various valves: 1) F308, F314, F328, F894, F895, F896, F897; 2) F307; 3) F335, F336.

### 3. Evaluation for Cause

- A. Preliminary Watts Bar unit 1: 1) The design change process requirements apparently did not require that a review of the adequacy of previous procurements be made and documented when design conditions were revised. 2) The drawing preparation process apparently lacks a definitive policy on the manner of presenting design and operating conditions on isometric and flow diagrams. 3) The component qualification process results were not required to be simultaneously tied to the design process and procurement process.
- Watts Bar unit 2: Causes 1) and 2) appear to be applicable to Watts Bar unit 2.

  B. Final 1) and 2) Our normal squadcheck and ECN process requires a review of all items affected by a design change for adequacy. Our flow and isometric diagrams list piping classifications and not actual operating pressure and temperature. Design conditions for the valves are calculated using operating temperatures and pressures. It was never intended that the valves be specified to flow diagram data. Also misuse of of the SI ECN may have contributed to the discrepancies.

  3) As above.

3) As above.

Resp. Org. M. R. Relear / 19184 Task Force Concurrence 1/9/8

## 4. Evaluation for Generic Examples

- A. Preliminary The generic examples could be identified by: 1) Review all safety related EEB procured valves where system design pressure/temperature conditions have changed since procurements to verify consistency of procurement documentation. 2) A review of all interfaces of low pressure, normally idle systems with high pressure normally operating systems for the adequate presentation of design and operating conditions. 3) The examples noted by B&V represented slow documentation of qualification rather than nonperformance of the qualification. Since this was ongoing incomplete work there is no need to identify generic examples. (However, the program control does need some improvement see 10A.)
- B. Final 1) All EEB procured valves were compared to new design pressure/
  temperature conditions using ANSI class rating and no discrepancies were found.
  2) A review of all interfaces was performed and no discrepancies were found.
  3) As above.

Resp. Org. MR Belur 1/9/84 Task Force Concurrence 1/19/84

| 5. Licensing Basis Satisfaction | is Satisfaction |
|---------------------------------|-----------------|
|---------------------------------|-----------------|

- A. Preliminary
  - 1) and 2) Until the evaluations in 4 are completed, the potential exists that the licensing basis was not satisfied. 3) N/A This work was in progress.
- B. Final
  - 1) and 2) All valves and interfaces were checked and found to satisfy the licensing basis. 3)  $\rm H/A$

Resp. Org. 98 Abelan 1 17 184 Task Force Concurrence 21/19184

- 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work
  - A. Preliminary
    - 1) and 2) WBNEEB 8207 and ECN 3511 address the B&V findings with the following exceptions: F308 and F314. The Task Force is not aware of any corrective actions yet specified. The NCR is not yet applicable to unit 2.
  - B. Final

N/A

Resp. Org. MR Believ 1 19 184 Task Force Concurrence 24 19184

- 7A. Identification of Corrective Action for Completed Work
  - A. Preliminary
    - 1) The generic deviations identified in 4 should be requalified to the current design conditions. 2) The flow diagrams should be revised to accurately and consistently present the design information. 3) N/A No deviations in completed work were substantiated.
  - B. Final

N/A

Resp. Org. 911 Believe / 19184 Task Force Concurrence

| 84. | Implementation | and | Inspection | of | Corrective | Action | - | Completed | Uaab |
|-----|----------------|-----|------------|----|------------|--------|---|-----------|------|
|     |                |     |            |    |            |        |   |           |      |

Preliminary

B. Final

N/A

Resp. Org. M R Bylew 1/4/84 Task Force Concurrence

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

1), 2), and 3) Task Force is not aware of any action.

B. Final

N/A

Resp. Org. MRB. lun 1/9/84 Task Force Concurrence

10A. Identification of Corrective Action for Future Work

A. Preliminary

1) Policy needs to be established for positive reassessment of procurement affected by design changes. 2) Drawing presentation of design conditions needs to be better specified. 3) The process of requalifying components whose seismic accelerations are analyzed to exceed procurement specifications needs to be formalized and included in the EP system.

B. Final

The engineering procedures in place (ECN, squadchecking, signature, further review) are adequate to prevent recurrence. EP 4.02 has been revised and a memorandum issued by management, controlling the use of the Sl ECN. EP 5.06 has been issued (5-27-80) to control preparation and review of specifications. Together these steps should avoid the concerns identified in step 3A.

Resp. Org. MR Below 1/9/84 Task Force Concurrence

| 114. | Implementation of Corrective Action for Future Work                   |           |
|------|-----------------------------------------------------------------------|-----------|
|      | A. Preliminary                                                        |           |
|      |                                                                       |           |
|      |                                                                       |           |
|      |                                                                       |           |
|      | B. Final                                                              |           |
|      | Corrections identified in 10A.B are in place.                         |           |
|      |                                                                       |           |
|      |                                                                       |           |
|      | Resp. Org. MRBelew 1/7/84 Task Force Concurrence                      | 1918      |
| LZA. | Verification of Effectiveness of Corrective Action for Future Work    |           |
|      | A. Preliminary                                                        |           |
|      |                                                                       |           |
|      |                                                                       |           |
|      |                                                                       |           |
|      | B. Finel                                                              |           |
|      |                                                                       |           |
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| ,    | Page 6                                                                |           |
|      | Resp. Org. // Task Force Concurrence                                  |           |
| 6B.  | Identification and Evaluation of Ongoing Corrective Action for Comple | eted Work |
|      | A. Preliminary                                                        |           |
|      | N/A                                                                   |           |
|      |                                                                       |           |
|      |                                                                       | •         |
| 1    | B. Final                                                              |           |
|      | N/A                                                                   |           |
|      |                                                                       |           |
|      | n                                                                     |           |
| 1    | Resp. Org. 99 R.Belev 1 19 184 Task Force Concurrence                 |           |

| 7 <b>B</b> . | Identification of Corrective Action for Completed Work                    |   |
|--------------|---------------------------------------------------------------------------|---|
|              | A. Preliminary                                                            |   |
|              | N/A                                                                       |   |
|              |                                                                           |   |
|              |                                                                           |   |
|              | 5. Final                                                                  |   |
|              | N/A                                                                       |   |
|              |                                                                           |   |
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|              | Resp. Org. M R B. Luw // 7/84 Task Force Concurrence                      | _ |
| 8B.          | Emplementation and Inspection of Corrective Action for Completed Work     | • |
|              | A. Preliminary                                                            |   |
|              | H/A                                                                       |   |
|              |                                                                           |   |
|              |                                                                           |   |
|              | 3. Final                                                                  |   |
|              | H/A                                                                       |   |
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|              | tesp. Org. 98 R Autur / 19/84 Task Force Concurrence                      |   |
| ЭВ.          | dentification and Evaluation of Ongoing Corrective Action for Future Work |   |
|              | . Preliminary                                                             |   |
|              | N/A                                                                       |   |
|              |                                                                           |   |
|              |                                                                           |   |
|              | • Final                                                                   |   |
|              | N/A                                                                       |   |
|              |                                                                           |   |
| ,            | esp. Org. MR R. Lew //9/84 Task Force Concurrence /                       |   |
|              | 125K Force Concurrence                                                    |   |

| 10B. Identification of Corrective Action for Future Work                |     | , |
|-------------------------------------------------------------------------|-----|---|
| A. Preliminary N/A                                                      |     |   |
| n/A                                                                     |     |   |
|                                                                         |     |   |
| B. Final                                                                |     |   |
| N/A                                                                     |     |   |
|                                                                         |     |   |
| Resp. Org. MARILUM 1/9/84 Task Force Concurrence                        |     |   |
| 113. Implementation of Corrective Action for Future Work                |     |   |
| A. Preliminary                                                          |     |   |
| N/A                                                                     |     |   |
|                                                                         |     |   |
| B. Finel                                                                |     |   |
| N/A                                                                     |     |   |
|                                                                         |     |   |
| Resp. Org. MRB. Low 1/7/84 Task Force Concurrence                       | / / |   |
| 12B. Verification of Effectiveness of Corrective Action for Future Work |     |   |
| A. Preliminary                                                          |     |   |
| N/A                                                                     |     |   |
|                                                                         |     |   |
| B. Final                                                                |     |   |
| N/A                                                                     |     |   |
|                                                                         |     |   |
|                                                                         |     |   |
| Page One                                                                |     |   |
| Resp. Org. / / Task Force Concurrence                                   |     |   |
| Resp. Org. // Task Force Concurrence                                    |     |   |
| Resp. Org. / / Task Force Concurrence                                   |     |   |

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R3 Date 3/13/84

- 1. Task Force Category 6 for Watts Bar Nuclear Plant Unit 2
- Task Force Category Description and Related Watts Bar Nuclear Plant unit 1 B&V Findings: Discrepancies between design documents (analysis results, load tables, isometric drawings, design drawings, etc.) used in the design of piping systems: F310, F319, F324, F325, F346, F751, F868.
- 3. Evaluation for Cause
  - A. Preliminary
    Watts Bar unit 1: (1) Regarding findings (F319, F324, F325, F346) the cause stems
    from ineffective handling of interfaces between two analysis (i.e., lap zones). (2)
    The remaining findings appear from the initial evaluation to be random errors in the
    design verification process with no uniquely definable cause.
    Watts Bar unit 2: These causes appear applicable to Watts Bar unit 2.
  - B. Final
    WBN unit 1: Regarding findings F319, F324, F325, and F346 the cause stems from:
    (la) ineffective handling of the interface region between two analyses and (lb)
    errors related to the use of the -ANCHOR program. (2) The remaining findings
    were determined to be random individual errors in the design process with no
    uniquely identifiable cause. The errors if uncorrected would not result in a
    failure of the piping pressure boundary or loss of system function. No additional
    evaluation is required. (See Continuation Sheet, page 7)
    Resp. Org. 72 (1844)
- 4. Evaluation for Generic Examples
  - A. Preliminary
    - (1) The scope of the evaluation for generic examples should include a review of all lap zones in Watts Bar unit 2. (2) The determination of generic examples will be made after the cause and effects of the individual findings are evaluated.
  - B. Final

(la, lb) The scope of the evaluation for generic examples should include a review of all rigorous analyzed lap zones and anchors (effected by the -ANCHOR program) in WBN unit 1. (2) No further evaluation is required, see 3.B.(2) above.

(1a, 1b) A review indicates that a maximum of 80 problems may require revisions due to lapping deficiencies. All skewed anchors which were analyzed using the direction cosine option in question will be reanalyzed.

Resp. Org. R Grand 3 1/5/84 Task Force Concurrence 3 1/6/84

| 5. | Licensing | Basts | Satisfaction |
|----|-----------|-------|--------------|
|----|-----------|-------|--------------|

### A. Preliminary

(1) The licensing bases for the unit 1 findings are not satisfied. (2) The determination of whether or not the licensing basis for the remaining unit I findings are satisfied will be made after the findings are evaluated. Items (1) and (2) would aiso apply to unit 2 licensing basis.

#### B. Final

(la, lb) The licensing basis for these findings is not satisfied. (2) The licensing basis is satisfied.

Resp. Org. 72 June 3/0784 Task Force Concurrence

# 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary (1) USNRC NUREG/CR-1980 addresses lapping in piping analyses. Also corrective action is in progress in response to unresolved Item 390/82-27-09 per NRC letter D.M. Verrelli to H. G. Parris dated September 10, 1982 and unit 1 NCR's WBMCEB 8233, WBNSWP 8309, WBNSWP 8312, WBNCEB 8232. This appears to be an adequate approach to unit 2 but the task force has not fully evaluated the corrective actions. (2) No corrective action is identified for this group of findings.

B. Final

(la) NCR WBNCEB8232 specifically addresses finding F346 for units 1 and 2. All lapped regions are being reviewed and corrections are being made to piping analysis and support design as required. Unresolved item 390/82-27-09 is being investigated and the correctness of the WBN lapping techniques is being verified. Criteria has been issued in the rigorous analysis handbook. This correction is judged adequate. (See Continuation Sheet, page 7.)

Resp. Org. 72 Guin 3/15/84 Task Force Concurrence

# 7A. Identification of Corrective Action for Completed Work

A. Preliminary

(1) Resolve differences in lap zones analyses and results and any designs resulting therefrom. (2) All findings not identified in 3.A.1 shall be evaluated to determine wnether or not the affected piping systems can be use-as-is if the conditions found by B&V were not corrected. This information will be used to determine if identification of other generic examples are required.

### B. Final

(la, lb) The plan in 6A.B. appears adequate. (2) Not applicable. No corrective action is required for unit 2.

Resp. Org. 7 Line 107ge Task Force Concurrence 216184

- &A. Implementation and Inspection of Corrective Action for Completed Work
  - A. Preliminary
  - B. Final (la) A review has indicated that a maximum of 80 problems may require revisions due to lapping deficiencies. It has not been determined how many of these problems will require reanalysis. This reanalysis effort is expected to be completed by 12/30/84. The effort is being tracked through NCR WBNCEB8221. The WBM lapping criteria has been verified by EDS (IMPELL) as being correct. (1b) All affected anchor load tables will be reissued. The expected completion date is 4/1/85. This effort is being tracked through NCR GENCEB8302. (2) Not applicable. Resp. Org. 72 Lange 3/45/74 Task Force Concurrence
- 9A. Identification and Evaluation of Ongoing Corrective Action for Future Work
  - A. Preliminary (1) USNRC NUREG/CR-1980 addresses lapping in piping analyses. Also corrective action is in progress in response to unresolved Item 390/82-27-09 per MRC letter D.M. Verrelli to H. G. Parris dated September 10, 1982 and unit 1 HCR's WHMCES 8233, WBHSWP 8309, WBNSWP 8312, WBNCEB 8232. This appears to be an adequate approach to unit 2 but the task force has not fully evaluated the corrective actions. (2) No corrective action has been identified for this group of findings.

B. Final

(la) As discussed in 6A.B the lapping criteria has been issued in the rigorous analysis handbook. (1b) As discussed in 6A.B the -ANCHOR program has been modified, the output has been modified, and the owners manual has been modified. (2) No further corrective action is required.

Resp. Org. 72 Comments Task Force Concurrence 2 16184

- 10A. Identification of Corrective Action for Future Work
  - A. Preliminary
  - B. Final

The action identified in 9A.B appears to be adequate.

Resp. Org. Telini 3/05/84 Task Force Concurrence 26/184

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|--------------------|---------------------|-----------------------------------------|--------------|
| lA. Implementation | of Corrective Acta  | ion for Future Work                     |              |
| A. Prelimines      |                     |                                         |              |
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| B. Finel           |                     |                                         |              |
| Refer to 9         |                     |                                         |              |
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|                    |                     |                                         | 3 16 67      |
| A. Verific tion o  | f Effectiveness of  | Corrective Action for Future Wo         | rk           |
| A. Preliminar      |                     |                                         |              |
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| B. Final           |                     |                                         |              |
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| Resp. Org.         | , ,                 | Task Force Concurrence                  |              |
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| B. Identification  | and Evaluation of O | Ongoing Cofrective Action for Co        | malated Uask |
| A. Preliminary     |                     | 0 0 11111111111111111111111111111111111 | whiered work |
| N/A                | ,                   |                                         |              |
| M/A                |                     |                                         |              |
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| B. Final           |                     |                                         |              |
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| Resp. Org.         |                     | Task Force Concurrence                  |              |

| a. raggerrication o | f Corrective Acti | ion for Completed Work         |             |
|---------------------|-------------------|--------------------------------|-------------|
| A. Preliminary      |                   | •                              |             |
| N/A                 |                   |                                |             |
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| B. Final            |                   |                                |             |
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| A. Preliminary.     |                   | Corrective Action for Complete | ed Work     |
| N/A                 |                   | •                              |             |
| N/A                 |                   |                                |             |
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| B. Final            |                   |                                | •           |
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| Resp. Org.          |                   | Task Force Concurrence         | / /         |
| Identification an   | d Evaluation of G | Ongoing Corrective Action for  |             |
| A. Preliminary      |                   |                                | ruture work |
| N/A                 |                   |                                |             |
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| B. Final            |                   | ·                              |             |
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| A. Preliminary  N/A  B. Final  Resp. Org. // Task Porce Concurrence //  J. Implementation of Corrective Action for Future Work  A. Preliminary  N/A  B. Final  Resp. Org. // Task Force Concurrence //  Verification of Effectiveness of Corrective Action for Future Work  A. Preliminary  N/A  B. Final | )B. | Identification of Corrective Action for Future Work |
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| J. Implementation of Corrective Action for Future Work  A. Preliminary  N/A  B. Final  Resp. Org. // Task Force Concurrence //  Verification of Effectiveness of Corrective Action for Future Work  A. Preliminary  N/A  B. Final                                                                         |     | B. Final                                            |
| J. Implementation of Corrective Action for Future Work  A. Preliminary  N/A  B. Final  Resp. Org. // Task Force Concurrence //  Verification of Effectiveness of Corrective Action for Future Work  A. Preliminary  N/A  B. Final                                                                         |     |                                                     |
| J. Implementation of Corrective Action for Future Work  A. Preliminary  N/A  B. Final  Resp. Org. // Task Force Concurrence //  Verification of Effectiveness of Corrective Action for Future Work  A. Preliminary  N/A  B. Final                                                                         |     |                                                     |
| J. Implementation of Corrective Action for Future Work  A. Preliminary  N/A  B. Final  Resp. Org. // Task Force Concurrence //  Verification of Effectiveness of Corrective Action for Future Work  A. Preliminary  N/A  B. Final                                                                         |     |                                                     |
| A. Preliminary  N/A  B. Final  Resp. Org. // Task Force Concurrence //  Verification of Effectiveness of Corrective Action for Future Work  A. Preliminary  N/A  B. Final                                                                                                                                 |     | Resp. Org. // Task Force Concurrence                |
| A. Preliminary N/A  B. Final  Resp. Org. // Task Force Concurrence // Verification of Effectiveness of Corrective Action for Future Work A. Preliminary N/A  B. Final                                                                                                                                     |     |                                                     |
| B. Final  Resp. Org. // Task Force Concurrence //  Verification of Effectiveness of Corrective Action for Future Work  A. Preliminary  N/A  B. Final                                                                                                                                                      | В.  | Implementation of Corrective Action for Future Work |
| B. Final  Resp. Org. // Task Force Concurrence //  Verification of Effectiveness of Corrective Action for Future Work  A. Preliminary  N/A  B. Final                                                                                                                                                      |     | A. Preliminary                                      |
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| Resp. Org. // Task Force Concurrence //  Verification of Effectiveness of Corrective Action for Future Work  A. Preliminary  N/A  B. Final                                                                                                                                                                |     |                                                     |
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| . Verification of Effectiveness of Corrective Action for Future Work  A. Preliminary  N/A  B. Final                                                                                                                                                                                                       |     |                                                     |
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| A. Preliminary N/A B. Final                                                                                                                                                                                                                                                                               |     | Resp. Org. // Task Force Concurrence //             |
| A. Preliminary N/A B. Final                                                                                                                                                                                                                                                                               |     | Verification of Efficiency                          |
| N/A  B. Final                                                                                                                                                                                                                                                                                             |     |                                                     |
| B. Final                                                                                                                                                                                                                                                                                                  |     | •                                                   |
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| Base 6                                                                                                                                                                                                                                                                                                    |     |                                                     |
| KRSD. OPA                                                                                                                                                                                                                                                                                                 |     | Resp. Org. / / Task Force Concurrence / /           |

TVA Task Force for Review of Black & Veatch Findings

### BLACK & VEATCH EVALUATION SHEET (Continuation Sheet)

3A. Evaluation for Cause

B. Final - continued

WBN unit 2: (la, lb) These causes appear to be applicable to WBN unit 2. (2) These random individual errors are not considered applicable to unit 2.

- 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work
  - B. Final continued

(1b) NCR GENCEB8302 R1 specifically addresses this cause. The "ANCHOR program has been modified, the output has been modified, and the users manual has been modified to reflect these changes. All skewed anchors which were analyzed using the direction cosine option in question will be reanalyzed. Anchor loads will be compared to the previous design loads, and anchors will be redesigned as needed. This correction is judged adequate. (2) Not applicable. No corrective action is required on unit 2.

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SERE?

Date 11/18/8

- 1. Task Force Category 7 for Matts Bar Muclear Plant Unit 2
- 2. Task Force Category Description and Related Watts Bar Muclear Plant unit 1 B&V Findings: Monconforming conditions in construction of previously inspected and accepted pipe supports: 1367, 1704, 1718, 1719, 1726, 1734, 1736, 1737, 1749, 1772, 2773, 2774, 2776, 2819, 2884, 2919, and 2920.
- 3. Evaluation for Cause
  - A. Preliminary

Watts Ber unit 1:

- On ones involving parts removed after final inspection cause unknown.
- On ones involving missing welds and members different than drawing oversight.
- On ones involving clearance and out of tolerance cause unknown. Watts Bar unit 2:
- These causes appear to be applicable to Watts Bar unit 2.
- B. Finel

Concur with A except clearance and out of tolerance problems are usually oversights.

Basp. Or Distant Polon 418/83 Task Force Concurrence 216 5 18183

- 4. Evaluation for Generic Examples
  - A. Preliminary

It is assumed that these examples existed through all systems.

B. Final

Concur with A except that we should not see the pipe weld problems of F718 in unit 2. This problem occurred because of a misinterpretation of a Bergen-Paterson drawing and has been corrected by additional training give to inspectors.

Resp. Or News P. Soun 9/11/83 Task Force Concurrence If 5 V8/83

A. Preliminary

Until the 79-14 program Phase I & Phase II has been completed, the potential exists for the licensing basis not being satisfied.

3. Final

Concur.

Resp. Or Stewar C. Stew 4/19/53 Task Force Concurrence 25/5/53

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

Corrective action is 79-14 program Phase I as defined by WBM-QCF-4.56. Corrective action is adequate.

B. Finel

Contur.

Resp. Or Chrystof Rose 4/18/83 Task Force Concurrence 25/5/83

7A. Identification of Corrective Action for Completed Work

A. Preliminary

The plan in 6A is adequate.

B. Final

Concur.

Resp. Org Apun Choun 4/R/63 Task Force Concurrence 25/5/83

# 8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

The implementation of NRC Bulletin OIE 79-14 is required prior to fuel loading. This requirement will ensure implementation and inspection of corrective action for completed work.

B. Final

Concur.

Besp. Org. Thomas & Babun 11/18/87 Force Concurrence 1/1/8/83

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

It is acceptable for TVA to continue with the program in place and to follow up with the 79-14 program.

B. Final

Concur.

Resp. Org. 1000 1/18/93 Task Force Concurrence 2/ 5 18/83

10A. Identification of Corrective Action for Future Work

A. Preliminary

Same comment as 9AA above.

B. Finel

Concur.

Resp. Org. Decues | Grown 4/18/83 Task Force Concurrence 21/6 5/8/83

| 114.        | L         | Plementation of Corrective Action for Future Work                                                                                                        |
|-------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
|             |           | Proliminary                                                                                                                                              |
|             |           | The results of the WBNP unit 1 79-14 inspection program will be monitored by the Office of Quality Assurance as detailed in memorandum (EDC 831011 401). |
|             | в.        | Finel                                                                                                                                                    |
|             |           | Concur.                                                                                                                                                  |
|             |           |                                                                                                                                                          |
|             | Res       | p. org. Mannus R Poets Task Force Concurrence When 11171 83                                                                                              |
| 2 <b>A.</b> | Ver       | ification of Effectiveness of Corrective Action for Future Work                                                                                          |
|             |           | Preliminary                                                                                                                                              |
|             |           | Implementation of Phase II of the 79-14 program will verify the final design an acceptance of the hangers.                                               |
|             | В.        | Final                                                                                                                                                    |
| ٠           |           | Concur. Audits by other groups will strengthen this program also. He further action required on this Black & Weatch category. This item is closed.       |
|             | Res       | o. organiane. Flore 4/8/43 Task Force Concurrence //                                                                                                     |
| 6B.         | Ider      | stification and Evaluation of Ongoing Corrective Action for Completed Work                                                                               |
|             | <b>A.</b> | Preliminary                                                                                                                                              |
|             |           | M/A                                                                                                                                                      |
|             |           |                                                                                                                                                          |
| 1           | В.        | Final                                                                                                                                                    |
|             |           |                                                                                                                                                          |
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| 7B. Identification of Cor  | rective Acei | on lon Carela  | and these    | ,             |    |
|----------------------------|--------------|----------------|--------------|---------------|----|
| A. Preliminary             | WEET         | og tot Comb)14 | COUNTR       |               |    |
| •                          |              |                |              |               |    |
| H/A                        |              |                |              |               |    |
|                            |              |                |              |               |    |
| 3. Final                   |              |                |              |               |    |
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| Resp. Org.                 | , ,          | _ Task Force   | Concuence    |               |    |
|                            |              | 25% 10168      | Concurrence  |               |    |
| 33. Implementation and Ins | pection of ( | Corrective Act | tion for Com | pleted Work   |    |
| A. Preliminary             |              |                |              |               |    |
| H/A                        |              |                |              |               |    |
|                            |              | , .            |              |               |    |
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| B. Finel                   |              |                |              | *             |    |
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| Resp. Org.                 |              | Task Force     | Concurrence  |               | 11 |
| B. Identification and Eva  | lustice of C | negina Connec  | Aima Assi    |               |    |
| A. Preliminary             |              | mentue correc  | EIVE ACTION  | ior Puture Wo | rk |
| H/A                        |              |                |              |               |    |
| ~/ <b>~</b>                |              |                |              |               |    |
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| B. Final                   |              |                |              |               |    |
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| 103. |     | entification<br>Preliminary<br>N/A |                   | ion for Future Work          |      |
|      | 3.  | Finel                              |                   |                              |      |
|      | le: | p. Org.                            |                   | Task Force Concurrence       |      |
| 113. | Lup | lementation                        | of Corrective Act | ion for Future Work          |      |
|      | ▲.  | Preliminary                        | ,                 |                              |      |
|      |     | H/A                                |                   |                              |      |
|      |     |                                    |                   |                              | ÷    |
|      | B.  | Final                              |                   |                              |      |
|      |     |                                    |                   |                              |      |
|      | Res | p. Org.                            |                   | Task Force Concurrence       |      |
| 128. | Ver | ification of                       | Effectiveness of  | Corrective Action for Future | Verk |
|      |     | Preliminary                        |                   |                              |      |
|      |     | H/A                                |                   |                              |      |
|      |     |                                    |                   | ,                            |      |
|      | В.  | Final                              |                   | •                            |      |
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TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R1 Date 6/3/83

- 1. Task Force Category 9 for Watts Bar Nuclear Plant Unit 2
- 2. Task Force Category Description and Related Watts Bar Nuclear Plant unit 1 B&V Finding Failure to adequately control and evaluate embedded plate capacity when multiple attachments were made to the plate by Construction: F506, F710, F711, F712, F713, F724R1, F730R1, F731R1
- 3. Evaluation for Cause
  - A. Preliminary

Watts Bar unit 1:

- EN DES procedures did not control or address the addition of attachments to embedded plates by Construction.
- Installation requirements and acceptance criteria on design output documents were not adequate (construction specifications and drawings).
- Watts Bar unit 2: These causes appear to be applicable to Watts Bar unit 2.
- B. Final

Same as Preliminary.

Resp. Org. WSP 7/20/85 Task Force Concurrence 7/20/83

- 4. Evaluation for Generic Examples
  - A. Preliminary

This finding applies to all embedded plates.

B. Final

Same as Preliminary.

A) Resp. Org. WBP 7/20/83 Task Force Concurrence 7 20/83

### 5. Licensing Basis Satisfaction

- A. Preliminary
  Licensing basis is satisfied thus far since the B&V findings and the sampling
  program performed to date has not identified any examples of embedded
  plates where failure would occur. Until the sampling program is
  completed, a potential exists for the licensing basis not being satisfied.
- B. Final Licensing basis is satisfied since neither the B&V findings nor the sampling program identified any plates in the sample that were structurally adequate.

# At Resp. Org. WGP 7/2083 Task Force Concurrence 24/20/83

- 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work
  - A. Preliminary
    The corrective action for NCR WBH CEB 8203 is a sample of 69 embedded plates
    to evaluate if a failure would occur in a worst case situation. Based on the
    results of the sample, further corrective action may be required. This approach
    is adequate.
  - B. Final

The corrective action for NCR WBNCEB8203 to sample 69 embedded plates was completed. No further corrective action is required.

# A) Resp. Org. WBP 7/2483 Task Force Concurrence 2/2 7 km/83

- 7A. Identification of Corrective Action for Completed Work
  - A. Preliminary

The plan in 6A appears to be adequate.

B. Final

Identification of corrective action for completed work is not required as all 69 sampled embedded plates were found to be structurally adequate.

A) Resp. Org. W&P 7/20/83 Task Force Concurrence 78-/73

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

No corrective action for completed work is required as all 69 sampled embedded plates were found to be structurally adequate.

A) Resp. Org. WBP 7/20/63 Task Force Concurrence 2/2 7 kg/83

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

Construction Specification for Watts Bar Nuclear Plant N3C-928, "Locating Attachments on Embedded Plates," provides requirements to Construction for locating attachments on embedded plates. Hanger drawings should reference this construction specification as required. This plan appears to be adequate.

B. Final

Corrective action as described in A is adequate.

AJ Resp. Org. WBP 7/20/83 Task Force Concurrence

10A. Identification of Corrective Action for Future Work

A. Preliminary

Plan in 9A appears adequate.

B. Final

Plan in 9A is adequate.

Resp. Org. WSP 7/20/83 Task Force Concurrence 2/20/83

| la. Imp | lementation of Corrective Action for Future Work                                                                                                                                                                                                                                |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|         | Preliminary                                                                                                                                                                                                                                                                     |
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|         |                                                                                                                                                                                                                                                                                 |
| В.      | Final                                                                                                                                                                                                                                                                           |
|         |                                                                                                                                                                                                                                                                                 |
|         | Appendix No. 4 to EN DES-EP 4.03 "Field Change Requests" provides instructions for handling field change requests on multiple attachments to embedded plates. This EN DES EP together with Construction Specification N3C-928 will ensure adequate resolution of this category. |
| Resp    | o. Org. A. den Atom 12/7/89 Task Force Concurrence 246/8-                                                                                                                                                                                                                       |
| A. Veri | fication of Effectiveness of Corrective Action for Puture Work                                                                                                                                                                                                                  |
|         | Preliminary                                                                                                                                                                                                                                                                     |
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| Resp    | Org. // Task Force Concurrence //                                                                                                                                                                                                                                               |
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| A. I    | rification and Evaluation of Ongoing Corrective Action for Completed Work Preliminary                                                                                                                                                                                           |
|         | I/A                                                                                                                                                                                                                                                                             |
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| 73. Identification of Corrective Action for Completed Work           |           |
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| A. Preliminary                                                       |           |
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| B. Final                                                             |           |
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| Resp. Org. // Task Force Concurrence                                 |           |
| Resp. Org Task Force Concurrence                                     |           |
| 83. Implementation and Inspection of Corrective Action for Completed | iinst     |
| A. Preliminary                                                       |           |
| W/A                                                                  |           |
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| B. Final                                                             |           |
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| Resp. Org. // Task Force Concurrence                                 |           |
| B. Identification and Evaluation of Ongoing Corrective Action for Fu | ture Work |
| A. Preliminary                                                       |           |
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| B. Finel                                                             | •         |
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| 103. Identification of | Corrective Action for Future Work               |     |
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| A. Preliminary         |                                                 |     |
| H/A                    | •                                               |     |
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| B. Finel               |                                                 |     |
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| Resp. Org.             |                                                 |     |
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| 13. Implementation of  | Corrective Action for Future Work               |     |
| A. Preliminary         |                                                 |     |
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| B. Final               |                                                 |     |
| o. Finel               |                                                 |     |
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|                        | ectiveness of Corrective Action for Future Work |     |
| A. Preliminary         |                                                 |     |
| H/A                    |                                                 |     |
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| B. Finel               |                                                 |     |
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| Page A                 | / / Task Force Concurrence                      |     |

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TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. 82 Date 12/27/83

- 1. Task Force Category 11 for Watta Bar Nuclear Plant Unit 2
- Task Force Category Description and Related Watts Bar Muclear Plant unit 1 B&V Findings: Inadequate documentation of operational modes data used in the analyses of piping systems: F331 and F373.
- 3. Evaluation for Cause
  - A. Preliminary
    Watts Bar unit 1:
    Insufficient control of design information used in piping analysis for operating conditions.
    Watts Bar unit 2:
    This cause appears applicable to Watts Bar unit 2.
  - B. Final

Same as 3.A.

Resp. Org. 72 6 12/27/83 Task Force Concurrence 25/6 15/84

- 4. Evaluation for Generic Examples
  - A. Preliminary

The findings suggest that other deviations may exist. The evaluation for generic examples should include a comparison of the operational modes design information with current design information for all safety-related piping systems.

B. Final
The WBH unit 1 findings suggest that other deviations may exist. A sample of piping
problems will be reviewed as discussed in EH DES-SEP 82-15. This is a sample of all
rigorously analyzed safety-related piping systems and includes portions of those
operating modes contained in CEB report 76-2 and in other sources. The sampling
program will be completed by 1/14/84. Only one problem has failed the sampling
evaluation to date and only the Safety Injection System (SIS) remains to be
completed.

Resp. Org. TE (2/3) Task Force Concurrence W/ 15/84

| 5. | Licensing | Basis | Satisfaction | 200 |
|----|-----------|-------|--------------|-----|

### A. Preliminary

Until the review for unit 1 is completed for all safety-related piping systems, the potential exists for the licensing not being satisfied.

### B. Finel

The licensing basis is not satisfied.

Resp. Org. TE Common PART Task Force Concurrence Wife 115184

# 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

### A. Preliminary

MCR WBMCRB 8215 and EM DES SEP 82-15 address the findings. SEP 82-15 does not adequately address the generic implications referred to in 4.

### B. Final

ECR WRECES 8215 and EM DES SEP 82-15 address the findings. SEP 82-15 (R1) includes identification and evaluation of worst case affects with the provision that the sampling program can be expanded as needed. The proper corrective action will be determined when the sampling program is completed.

Resp. Org. TE 12/29/89 Task Force Concurrence 2/15/84

# 7A. Identification of Corrective Action for Completed Work

### A. Preliminary

All deviations found in the comparison recommended in 4 must either be resolved by (1) resnalysis of the piping systems or (2) identification and analyses of worst case(s) to justify acceptability.

### B. Final

The plan in 6A.B appears adequate.

Resp. Org. Telemin Rizilis Task Force Concurrence Office /15784

| 84. | Implementation | and | Inspection | ٠ . | Corrective | Action   | for | Completed  | Vork |
|-----|----------------|-----|------------|-----|------------|----------|-----|------------|------|
|     |                |     | TRAPACETON | •   | COSTACTIVE | WC L TOB | LOE | COMPTRICES | TOI  |

A. Preliminary

#### B. Final

The sample program is still in progress and will be completed by 1/14/84. The single problem that failed the evaluation has been reanalyzed. Only SIS remains to be completed. This entire effort is being tracked through MCR WBMCEB8215.

Resp. Org. ZECTION Task Force Concurrence 2/15184

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

Task force is not aware of ongoing corrective action for future work.

B. Final

There is no ongoing corrective action for future work.

Resp. Org. 75 Comin 12 183 Task Force Concurrence 2 1 157 84

10A. Identification of Corrective Action for Future Work

A. Preliminary

224

Programmatic correction is needed to: (1) document the control of operating condition design information and (2) improve adherence to these controls.

B. Final - In the short term to improve documentation and control of operation modes, isometrics will be squadchecked early in the analysis to specifically confirm correct operating modes. The isometric op mode information will be clarified and updated as needed. In addition, the project system designer will inform the piping analysts in writing of any op mode change which has the potential of affecting analysis so that this effect can be reviewed. (This will be further reviewed for long-term corrective action when the WBH sampling program is is completed.) Methodology for handling op modes will be placed in the Rigorous Analysis Handbook.

See Continuation Sheet (page 7).

Resp. Org. 76 10/8 Task Force Concurrence

-3-

| A. Implementation of A. Preliminary |                   |                                                 |                                 |           |
|-------------------------------------|-------------------|-------------------------------------------------|---------------------------------|-----------|
|                                     |                   |                                                 |                                 |           |
| B. Finel                            |                   | •                                               |                                 |           |
|                                     | 9.4               |                                                 |                                 |           |
| 1/30/86. This                       | s effort is being | perational modes docum<br>g tracked through NCR | ents will be dev<br>WBMCEB8215. | eloped by |
| _                                   |                   |                                                 |                                 |           |
| Resp. Org. 756                      | 12(5)(3)          | Task Force Concurren                            | ace Iffer                       | 11518     |
| . Verification of Ef                | ifectiveness of ( | Corrective Action for 1                         | future Work                     |           |
| A. Preliminary                      |                   | •                                               |                                 |           |
|                                     |                   |                                                 |                                 |           |
| •                                   | •                 |                                                 |                                 |           |
| B. Final                            |                   |                                                 |                                 |           |
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|                                     |                   |                                                 |                                 |           |
|                                     | Evaluation of O   | ngoing Corrective Acti                          | on for Completed                | Work      |
| A. Preliminary                      |                   |                                                 |                                 |           |
| H/A                                 | ,                 |                                                 |                                 |           |
|                                     |                   |                                                 | •                               |           |
| B. Final                            |                   |                                                 | -                               |           |
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|                                     |                   | Task Force Concurren                            | •                               |           |

| A. Preliminary       |               | ion for Completed Work                |                 |
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| 11/A                 |               |                                       |                 |
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|                      |               |                                       |                 |
| B. Final             |               |                                       |                 |
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| . Implementation and | Inspection of | Corrective Action for Com             | pleted Work     |
| A. Preliminary       |               |                                       |                 |
| H/A                  |               |                                       |                 |
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| B. Final             |               |                                       |                 |
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| Identification and   | Evaluation of | Ongoing Corrective Action             |                 |
| A. Preliminary       |               | ongoing corrective Action             | ior future work |
| H/A                  |               |                                       |                 |
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|                      | •             |                                       |                 |
| B. Final             |               |                                       |                 |
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| 103. | Identification of Corrective Action for Future Work                |          |
|------|--------------------------------------------------------------------|----------|
|      | A. Preliminary                                                     |          |
|      | H/A                                                                |          |
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|      | ,                                                                  |          |
|      | B: Finel                                                           |          |
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|      | Resp. Org Task Force Concurrence                                   |          |
|      |                                                                    |          |
| 118. | Implementation of Corrective Action for Future Work                | •        |
|      | A. Preliminary                                                     |          |
|      | N/A                                                                |          |
|      |                                                                    |          |
|      |                                                                    |          |
|      | B. Final                                                           |          |
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|      | Resp. Org / Task Force Concurrence                                 |          |
| 128. | Verification of Effectiveness of Corrective Action for Future Work |          |
|      | A. Preliminary                                                     |          |
|      | H/A                                                                |          |
|      | or a                                                               |          |
|      |                                                                    |          |
|      | 3. Final                                                           |          |
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|      | Resp. Org / / Task Force Concurrence                               |          |

TVA Task Force for Review of Black & Veatch Findings

BLACK & VEATCH EVALUATION SHEET (Continuation Sheet)

10A. Identification of Corrective Action for Future Work

B. Final - Continued

The long-term corrective action has been identified. Documents concerning operational modes will be developed by WBP by 1/30/86. These documents will be maintained as retrievable records in accordance with TVA's quality assurance program. When reanalysis is required, this will require the operational modes to be reviewed and QA documented. Revision to the operational modes will cause the QA documents to be revised.

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SERET

Rev. R2 Date 11/9/83

- 1. Task Force Category 12 for Matts Bar Muclear Plant Unit 2
- 2. Task Force Category Description and Related Watts Bar Muclear Plant unit 1 B&V Findings: Failure by EM DES and COMST to properly implement and document the alternate analysis criteria for seismically supported piping: F347
- 3. Evaluation for Cause
  - A. Preliminary

Watts Bar unit 1: Failure to have adequate training in EM DES and COMST on the requirements of the alternate analysis criteria. Failure to have an adequate program to ensure that the implementation of the alternate analysis criteria was verified through audits or independent checking process.

Watts Bar unit 2: These causes appear to be applicable to Watts Bar unit 2.

B. Final

The causes shown above in 3A are correct based on the Guidelines for Completing Evaluation;" however, there are some very important and basic causes that are not addressed. These were identified in the findings of the Alternate Analysis Review Team and Independent Review Team.

Resp. Org. R.D. Patt 517183 Task Force Concurrence

- 4. Evaluation for Generic Examples
  - A. Preliminary
    This finding applies to all the Watts Bar unit 2 analysis and pipe support designs for alternately analysed piping performed by EN DES and all of the pipe supports installed by COHST's implementation of the 47A053 drawing series. All deviations will be identified by implementation of EN DES SEP 82-18 "Program For Alternate Analysis Fix Coordinating, Documenting, and Verifying" (SWP 820917012) and the corrective action for NCR WBNCEB 8231.
  - B. Final
    This finding applies to all WBN Unit 2 analyses for alternately analyzed piping performed by EN DES. CONST had not attempted to locate any supports in accordance with the 47A053 drawing series for WBN Unit 2. The exact methods to be used to verify the qualification of piping in WBPs scope has not been determined for WBN Unit 2. Verification of qualification of piping in CEBs scope will also be

performed Sheath 5/7/83 Task Force Concurrence 24 61/183

- 5. Licensing Basis Satisfaction
  - A. Preliminary

Until the review in 4 is completed, the potential exists for the licensing basis on Watts Bar unit 2 not being satisfied.

B. Final

Sense s 54. Based on the deficiencies found on Unit 1, the licensing basis is not satisfied for Unit 2.

Resp. Org. R. S. Prett 5/17/83 Task Force Concurrence 26 61/183

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary - The corrective action for NCR's WBHSWF 8252 and 4164R is a 100% verification per EM DES SEP 82-18 of all Watts Bar unit 2 pipe supports that were alternately analysed by the Sequoyah and Watts Bar Design Projects (SWP). This SEP identifies and corrects all deficiencies in the design and installation of pipe supports that were performed by SWP using the alternate analysis program. Corrective action for NCR WBM CEB 8231 is a verification of the Watts Bar unit 2 problems alternately analyzed by the Civil Engineering Support Branch (CEB) and includes having the supports verified as adequate or corrected by B. Final

See attached sheet

Resp. Org. R. S. Patt 51/7/83 Task Force Concurrence 2/6 6 1/183

- 7A. Identification of Corrective Action for Completed Work
  - A. Preliminary

Plan in 6A appears to be adequate.

B. Final

Plan in 6AB is adequate.

Resp. Org. R.D. Poett 57/7/83 Task Force Concurrence William 6//183

- SA. Implementation and Inspection of Corrective Action for Completed Work
  - A. Preliminary
  - B. Final

The corrective action stated in step 6A.B. is not complete. This corrective action will be tracked through completion by NCR WBMSWP8252 R2. This MCR is an open 50.55(e) item for Unit 2 and will require tracking until it is complete.

Resp. Org. R. D. Prett 11/9/83 Task Force Concurrence 26/104/83

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary - Corrective Action for MCR's WBM SWP 8252 and 4164R has been identified as follows: SWP EP 43.21 "Alternate Analysis of Piping Systems - Documenting and Verifying" has been issued to control the implementation of the alternate analysis program. The 47A053 series support drawings will be revised to correctly implement the alternate analysis criteria. Training will be provided to EM DES and COMST personnel responsible for implementing the alternate analysis criteria. This appears to be adequate. Corrective action for MCR WBM CEB 8231 has not yet been identified.

B. Final

See attached sheet.

Resp. Org. R.D. Pratt 5/27/83 Task Force Concurrence 26 6 1/ 187

- 10A. Identification of Corrective Action for Future Work
  - A. Preliminary

The plan in 9A appears to be adequate.

B. Final
Plan in 9AB is adequate.

Resp. Org. R. D. Pratt 51/783 Task Force Concurrence William G 1/183

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|             | 3.        | Pinel                                                  |                                                          |                                        |                                                          |                                                                                |        |
|             |           | have been mainta<br>analysis. Ream<br>rigorous analysi | e 47A053 drawi<br>mined. In the<br>malysis of the<br>is. | ng series.<br>future, Cl<br>current al | Rosters of pers<br>EB will not analy<br>ternate analysis | m issued. Revisionel attending to<br>the piping by alter<br>problems will be 1 | rainin |
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| l <b>A.</b> | Ver       | ification of Effe                                      | ectiveness of                                            | Corrective                             | Action for Putur                                         | e Work                                                                         |        |
|             | <b>A.</b> | Preliminary                                            |                                                          |                                        |                                                          |                                                                                |        |
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|             | B.        | Final                                                  |                                                          |                                        |                                                          | ·                                                                              |        |
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| В.          | Ldet      | tification and E                                       | valuation of (                                           | Ongoing Cor                            | rective Action f                                         | or Completed Work                                                              |        |
|             |           | Preliminary                                            |                                                          |                                        |                                                          | •                                                                              |        |
|             |           | H/A                                                    | •                                                        |                                        |                                                          |                                                                                |        |
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| 1           | B.        | Final                                                  |                                                          |                                        |                                                          |                                                                                |        |
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|             |           | A                                                      |                                                          |                                        | ce Concurrence                                           |                                                                                |        |

| . Ide     | atification of Corrective Actio | on for Completed Work              |                                       |
|-----------|---------------------------------|------------------------------------|---------------------------------------|
| <b>A.</b> | Preliminary                     |                                    |                                       |
|           | H/A                             |                                    |                                       |
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| В.        | Final .                         |                                    |                                       |
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| . Imp     | lementation and Inspection of ( | Corrective Action for Completed Wo | rk                                    |
| ٨.        | Preliminary                     |                                    |                                       |
|           | H/A                             |                                    |                                       |
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|           | Final                           |                                    |                                       |
| D.        | Final                           |                                    |                                       |
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|           |                                 | Ongoing Corrective Action for Futu | ire Work                              |
| A.        | Preliminary                     |                                    |                                       |
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| в.        | Final                           |                                    |                                       |
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| A. Preliminary  B. Final  Basp. Org                                                                                                                                                                                                                                  | <b>/</b> _ |
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| Basp. Org/ Task Force Concurrence//  13. Implementation of Corrective Action for Puture Work  A. Preliminary  #/A  B. Final  Pasp. Org/ Task Force Concurrence//  23. Verification of Effectiveness of Corrective Action for Puture Work  A. Preliminary  #/A        |            |
| Resp. Org. // Task Force Concurrence //  IB. Implementation of Corrective Action for Puture Work  A. Preliminary  W/A  B. Final  Resp. Org. // Task Force Concurrence //  B. Verification of Effectiveness of Corrective Action for Future Work  A. Preliminary  W/A | /          |
| B. Pinel  B. Finel  B. Verification of Effectiveness of Corrective Action for Future Work  A. Preliminary  H/A                                                                                                                                                       |            |
| B. Pinel  B. Finel  B. Verification of Effectiveness of Corrective Action for Future Work  A. Preliminary  H/A                                                                                                                                                       |            |
| A. Preliminary  N/A  B. Final  Resp. Org. // Task Force Concurrence //  B. Verification of Effectiveness of Corrective Action for Future Work  A. Preliminary  H/A                                                                                                   |            |
| B. Final  B. Final  Task Force Concurrence //  B. Verification of Effectiveness of Corrective Action for Future Work  A. Preliminary  H/A                                                                                                                            |            |
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| B. Verification of Effectiveness of Corrective Action for Future Work  A. Preliminary  H/A                                                                                                                                                                           | ,          |
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| B. Verification of Effectiveness of Corrective Action for Future Work  A. Preliminary  H/A                                                                                                                                                                           | •          |
| B. Verification of Effectiveness of Corrective Action for Future Work  A. Preliminary  H/A                                                                                                                                                                           | ,          |
| A. Preliminary                                                                                                                                                                                                                                                       |            |
| W/A                                                                                                                                                                                                                                                                  |            |
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| B. Final                                                                                                                                                                                                                                                             |            |
| B. Finel                                                                                                                                                                                                                                                             |            |
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Task Force for B&V Findings
Task Force Category 1 - WBN Unit 2

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

## B. Final

The corrective action for NCRs WBNSWP8252 (and other associated EN DES NCRs) will be a 100% verification of all piping alternately analyzed by WBP. Associated support designs will be verified as adequate or corrected by WBP. CONST has not used the 47A053 drawing series for location of supports on WBN Unit 2. Corrective action for CEB analysis will be a verification of the WBN Unit 2 problems alternately analyzed by CEB and includes having the supports verified as adequate or corrected by SWP. These plans are adequate.

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

# B. Final

The action to prevent recurrence for NCR WBNSWP8252 (and other associated EN DES NCRs) is the implementation of SWP-EP 43.21 "Alternate Analysis of Piping Systems - Documenting and Verifying." The 47A053 drawing series has been revised to correctly and more clearly implement the alternate analysis requirements. Training has been provided to SWP and CONST personnel responsible for implementing the alternate analysis requirements. SWP will review a sufficient quantity of CONSTs application of the 47A053 drawing series to confirm proper implementation. These plans should be adequate.

The action to prevent recurrence for CEB has not been identified.

TVA Task Force for Review of Black & Vestch Findings

EVALUATION SHEET

Rev. 21 Date 5/6/83

- 1. Task Force Category 13 for Matts Bar Muclear Plant Unit 2
- Task Force Category Description and Related Matts Bar Nuclear Plant unit 1 16V Findings:

Termination information on the documentation was in error and was not updated to reflect the actual configuration: F142.

- 3. Evaluation for Cause
  - A. Preliminary

Watts Bar unit 1: The example B&V finding was an oversight and it is felt it is an isolated case. Watts Bar unit 2: This cause does not appear to be applicable to Watts Bar unit 2.

B. Finel

In addition to the sampling which was done for unit 1, a check was made of the 19 shielded cables which have been terminated on unit 2, system 3. The field configuration was compared to the connection drawings which were compared to the termination slips. There were no errors.

Rasp. Org. Ed Bush 4/18/83 Task Force Concurrence 25/1- 4/2-193

- 4. Evaluation for Generic Examples
  - A. Preliminary
    Watts Bar unit 1: To confirm that the example was isolated, the following sample
    is being evaluated for Watts Bar Unit 1: Compare 40 AFW termination records to
    the termination diagrams. The sample should contain 20 records involving the
    inspector and engineer on B&V finding F-142 and 20 records involving others.
    Watts Bar unit 2: No action will be required for Watts Bar unit 2 unless the
    sample of Watts Bar unit 1 identifies deviations.

    B. Final

This category is not considered to be generic since there were no errors identified on any of the records.

Resp. Org. Ed Bul 4/18/83 Task Force Concurrence Wan 4/20/53

5. Licensing Basis Satisfaction

A. Preliminary
Watto Bar unit 1:
The example identified thus far satisfied the licensing basis. Until sampling is completed, a potential exists for the licensing basis not being satisfied.
Watto Bar unit 2:
There is nothing that suggests the licensing basis has not been satisfied unless the sample in 4 identifies deviations.

B. Final

The licensing basis is satisfied and no further action is required.

Basp. Org. Ed Bushe 4/18/83 Task Force Concurrence 24/2483

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

Task force is not aware of any action.

B. Final

No further action required since no errors were found.

Resp. Org. Ed Bush 4/18/83 Task Force Concurrence 25 4/2483

7A. Identification of Corrective Action for Completed Work

A. Preliminary

B. Final Based on the results of the construction sample as stated in 3.B, no corrective action for completed work is required.

Resp. Org. Ed BiRRE 19/16/83 Task Force Concurrence 246 46483

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| - 8A. Implementation and Inspection of Corrective Action for Completed Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| A. Proliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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| 3. Final                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| No action required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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| Resp. Org. Ed Burk. / 1/18/27 Task Force Concurrence 2/1/2-183                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 9A. Identification and Evaluation of Ongoing Corrective Action for Future Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| A. Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Task force is not aware of any action.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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| B. Final                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| No further action required since no errors were found.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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| Resp. Org. Concurrence 21/2/83 Task Force Concurrence 21/2/83                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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| 10A. Identification of Corrective Action for Future Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| A. Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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| B. Final                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| No action required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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Resp. Org. Pd Burke /4/RB Task Force Concurrence 24/18/18

| 1 <b>A.</b> 1 | implementation of Corrective Action for Pature Work                                      |
|---------------|------------------------------------------------------------------------------------------|
| . 4           | . Preliminary                                                                            |
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|               |                                                                                          |
|               |                                                                                          |
| 1             | • Final                                                                                  |
|               | No action required.                                                                      |
|               |                                                                                          |
|               |                                                                                          |
| 1             | esp. org. Ed Burko, 19/18/67 Task Force Concurrence 24/18/67                             |
|               | L- 17                                                                                    |
| A. V          | erification of Effectiveness of Corrective Action for Future Work                        |
|               | - Preliminary                                                                            |
|               |                                                                                          |
|               |                                                                                          |
|               |                                                                                          |
| 3             | Finel                                                                                    |
|               | No action required.                                                                      |
|               |                                                                                          |
|               | Rem 3/3/87                                                                               |
| Ri<br>        | sp. Org. A 18/M Task Force Concurrence                                                   |
| B. Id         | entification and Evaluation of Consider Course                                           |
|               | entification and Evaluation of Ongoing Corrective Action for Completed Work  Preliminary |
|               | M/A                                                                                      |
|               |                                                                                          |
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| В.            | Final                                                                                    |
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| <b>Le</b>     | sp. Org/ Task Force Concurrence//                                                        |
|               |                                                                                          |

| 73. Identification of Corrective Action for Completed Work           |            |
|----------------------------------------------------------------------|------------|
| A. Proliminary                                                       |            |
| W/A                                                                  |            |
|                                                                      |            |
| B. Final                                                             |            |
| * Final                                                              |            |
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| Resp. Org. / / Task Force Concurrence                                |            |
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| 13. Implementation and Inspection of Corrective Action for Completes | i Work     |
| A. Preliminary                                                       |            |
| B/A                                                                  |            |
|                                                                      |            |
| 3. Final                                                             | •          |
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| Resp. Org Task Force Concurrence                                     |            |
| B. Identification and Evaluation of Ongoing Corrective Action for F  | uture Work |
| A. Preliminary                                                       |            |
| H/A                                                                  |            |
|                                                                      |            |
|                                                                      |            |
| 3. Final                                                             |            |
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| 100           | Identification of Corrective Action for Future Work                |     |
|---------------|--------------------------------------------------------------------|-----|
| 100.          |                                                                    |     |
|               | A. Preliminary                                                     |     |
|               | W/A                                                                |     |
|               |                                                                    | •   |
|               | 3. Final                                                           |     |
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|               | Resp. Org. / / Task Force Concurrence                              | , , |
|               |                                                                    |     |
| 113.          | Implementation of Corrective Action for Future Work                | ٠   |
|               | A. Preliminary                                                     |     |
|               | H/A                                                                |     |
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|               |                                                                    |     |
|               | B. Final                                                           |     |
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|               | Resp. Org. // Task Force Concurrence                               |     |
|               | Resp. Org. // Task Force Concurrence                               |     |
| L2 <b>3</b> . | Verification of Effectiveness of Corrective Action for Future Work |     |
|               | A. Preliminary                                                     |     |
|               | W/A                                                                |     |
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|               |                                                                    |     |
|               | B. Finel                                                           |     |
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|               | Resp. Org. // Task Force Concurrence                               |     |

TVA Task Force for Raview of Black & Veatch Findings

EVALUATION SHEET

Rev. Ri Date 12/22/83

- 1. Task Force Category 14 for Watts Bar Nuclear Plant Unit 2
- Task Force Category Description and Related Watts Bar Muclear Plant unit 1 B&V Findings: Various supports on the AFW system have not been modified, redesigned, or initially designed per the revised analysis of ECN 2576: #369, #371, #756, #767, #783, #784, #788, #794, #845, #853, #855, #899, F911, F949, #950, F951, F955, F958, F963, F964, F965, and #821.
- 3. Evaluation for Cause
  - A. Preliminary Watts Bar unit 1: An ineffective tracking of work progress under CRB 81-30. SWP's tracking of the status of ECN 2576 provided the inaccurate conclusion that unit 1 work was completed. No formal controls were required for ECMs which required many work items over a relatively long period of time and for which responsibility was transferred between supervisors.

    Watts Bar unit 2: This cause appears to be applicable to Watts Bar unit 2.
  - B. Finel

The above causes may be applicable to unit 2. Unit 2 hangers involved with ECM 2576 have not been completed and no determination for unit 2 can be mad:

Resp. Org. 9 Mark 1/3/84 Task Force Concurrence 115/84

- 4. Evaluation for Generic Examples
  - A. Preliminary

Since all unit 2 hangers were covered by ECN 2576, a complete review of work under ECN 2576 is needed to identify generic examples in rigorous analysis. No action beyond the scope of the ECN 2576 review will be required for Watts Bar unit 2 unless the sample of Watts Bar unit 1 identifies deviations.

B. Final

Since the review of ECN 2576 and ECN 3184 on unit 1 indicated that the problem with unit 1 is not generic, see memo to Files dated 12/14/83 (WBP 831214 001), no further action beyond incorporating the scope of ECN 2576 is required.

Resp. Org. 4 Mod 1 13 184 Task Force Concurrence Wife 15 184

|    | • - | _        |       |        |        |
|----|-----|----------|-------|--------|--------|
| 5. | Ļ   | icensing | Basis | Satisf | tetion |

A. Preliminary

Until the evaluations in 4 are completed, there is no reason to suspect that the licensing basis has not been satisfied.

B. Final

By following procedures in WBP-EP 43.14, the scope of ECM 2576 will be implemented correctly ensuring that the licensing basis is satisified.

Resp. Org. 99 Mon Q / 13184 Task Force Concurrence 24/15/84

- 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work
  - A. Preliminary

The task force is not aware of any action.

B. Final

The implementation of ECN 2576 for unit 2 is not complete. However, following WEP-EP 43.14 will ensure the ECN is incorporated correctly and no corrective action will be necessary.

Resp. Org. 990 113184 Task Force Concurrence 115184

- 7A. Identification of Corrective Action for Completed Work
  - A. Preliminary

Unless the review in 4 identifies deviations, no corrective action for completed work is required.

B. Final

No corrective action for completed work can be identified until ECN 2576 is completed for unit 2.

Resp. Org. J Mosk 1 13184 Task Force Concurrence 24 15184

|  | 82. | Implementation | and | Inspection | of | Corrective Action | for | Completed He |  |
|--|-----|----------------|-----|------------|----|-------------------|-----|--------------|--|
|--|-----|----------------|-----|------------|----|-------------------|-----|--------------|--|

A. Preliminary

#### B. Final

All work on unit 2 implemented under ECH 2576 will be tracked by the ECH process per TVA procedures.

Resp. Org. 9970 1/3/84 Task Force Concurrence 1/5/84

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

Task force is not aware of any action.

B. Final

See Step 10A.B.

Resp. Org. 90 March 1 3 184 Task Force Concurrence 2/1/84

10A. Identification of Corrective Action for Future Work

A. Preliminary

Criteria need to be established for the identification of need for employment of tracking systems, as well as for implementing them. This criteria should be linked to the establishment of SEPs.

B. Final
All future ECHs on WBP will be written for a single unit only, therefore, eliminating much of the problem that occurred with ECH 2576. To prevent recurrence the review of analysis isometrics and load tables per the scope of the ECH have been upgraded to formal calculation packages requiring appropriate documentation. This upgrading and documentation per the scope of the ECH are requirements that have been incorporated into WBP-EP 43.14.

Resp. Org. Sync 1/3/84 Task Force Concurrence 115/84

| A. Preliminary                    | orrective Action for Future Work                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| WBP-EP 43.14 is<br>ensure that no | uations of analysis isometrics and load<br>1 be performed using standard evaluation<br>sued 8-22-83 (ESB 830822 202). This eva<br>support revisions are overlooked. Each<br>rmal calculation package and will be mic | sheets in accordance will continue to the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the st |
| Resp. Org. 99 Mos                 | 1/3/84 Task Force Concurrence                                                                                                                                                                                        | 24/ 1518                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| . Verification of Eff             | ectiveness of Corrective Action for Futu                                                                                                                                                                             | re Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| A. Preliminary                    |                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| B. Finel                          |                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| Resp. Org.                        |                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| . Identification and 1            | Evaluation of Ongoing Corrective Action                                                                                                                                                                              | for Completed Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| A. Preliminary                    | 4 · · · · · · · · · · · · · · · · · · ·                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| H/A                               |                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| B. Final                          |                                                                                                                                                                                                                      | •                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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| 73. | Identification of Corrective Action for Completed Work  A. Preliminary  N/A                |
|-----|--------------------------------------------------------------------------------------------|
|     | B. Final                                                                                   |
|     | Resp. Org. // Task Force Concurrence //                                                    |
|     | Implementation and Inspection of Corrective Action for Completed Work                      |
|     | A. Preliminary N/A                                                                         |
|     | B. Final                                                                                   |
|     |                                                                                            |
|     | Resp. Org. // Task Force Concurrence //                                                    |
|     | Identification and Evaluation of Ongoing Corrective Action for Future Work  A. Preliminary |
|     | n/a                                                                                        |
| j   | B. Pinal                                                                                   |
|     | Resp. Org//_ Task Force Concurrence//                                                      |

|       | Identification of  | Corrective Action | for Future W   | ork             |          |
|-------|--------------------|-------------------|----------------|-----------------|----------|
|       | A. Preliminary     |                   |                |                 |          |
|       | N/A                |                   |                |                 |          |
|       |                    |                   |                |                 |          |
| . '   | B. Final           |                   |                |                 |          |
|       |                    | •                 | -              |                 |          |
|       |                    |                   |                |                 |          |
|       |                    |                   |                |                 |          |
|       | Resp. Org.         |                   | Task Force Co  | ncurrence       |          |
| IB. 1 | implementation of  | Corrective Action | for Puture W   | rk              | <u> </u> |
|       | . Preliminary      |                   |                | · <del></del>   |          |
|       | M/A                |                   | •              |                 |          |
|       | ,                  | •                 |                |                 |          |
|       |                    |                   |                |                 |          |
| 1     | 3. Final           | **                |                |                 |          |
|       | -                  |                   |                |                 | ."       |
|       | * .                | ٠                 |                | ,               |          |
| 1     | Resp. Org.         |                   | Task Force Co  |                 |          |
|       |                    |                   |                |                 |          |
|       | Verification of Ef | fectiveness of Co | rrective Actio | n for Future Wo | rk       |
| Ł     | A. Preliminary     | •                 | •              |                 |          |
|       | N/A                |                   |                |                 |          |
|       |                    |                   |                | •               |          |
| B     | . Final            |                   | •              |                 |          |
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|       |                    |                   |                |                 |          |
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|       | esp. Org.          |                   |                |                 |          |

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R1 Date 11/1/83

- 1. Task Force Category 18 for Watts Bar Nuclear Plant Unit 2
- Task Force Category Description and Related Watts Bar Muclear Plant unit 1 86V Findings:
   A technical note on a piping support drawing (47A050-1T note #3) was found to be invalid for some applications: F761
- 3. Evaluation for Cause
  - A. Preliminary
    Watts Bar unit 1:
    Drawing was not adequately checked and no calculations were
    performed to verify the adequacy of the technical note on
    the pipe support drawing.
    Watts Bar unit 2:
  - These causes appear to be applicable to Watts Bar unit 2.

    B. Final

    The note was issued with the intention that its application is good for self-drilling anchor bolts only (the maximum diameter is 7/8 inch). The designer and checker did not anticipate any other types of bolt sizes larger than 7/8-inch diameter that will be used in pipe supports. Later, different type bolts (and thus larger bolts) were used but the note was not revised.

Basp. Org. R.D. Patt 4/983 Task Force Concurrence Office 1/1/0/13

- 4. Evaluation for Generic Examples
  - A. Preliminary
    - Find all examples where a 1-1/4" or larger wedge bolt was omitted because of note 3 on drawing 47A050-1T.
    - This finding indicates that deviations could exist for technical notes on other typical support drawing series. No action will be required for Watts Bar unit 2 unless the sample of Watts Bar unit 1 identifies deviations.
  - E. Final

    EN DES has identified 10 systems of which there are supports that have 1-1/4"
    diameter wedge bolts. We will review these supports and will continue our
    evaluation to determine if there are other supports (with another type of bolts
    which sizes are larger than 7/8" diameter) that are a potential candidate for the
    note. EN DES will send these drawings to CONST for verification (if the note is
    applicable). EN DES has completed the evaluation of all typical supports and
    general notes and found all to be adequate (WBP 830914 230).

Resp. Org. R. D. Past 10/24/83 Task Force Concurrence 24/ 1/1/483

- 5. Licensing Basis Satisfaction
  - A. Preliminary

Licensing basis impact cannot be determined until all examples of deviations are identified and evaluated.

B. Final

Sens-co-5-As As a result of the review in step 4 of other typical notes and the results of step 8A raview for applications of the deficient note, the licensing basis is met.

Resp. Org. R. D. Pact 4/5/83 Task Force Concurrence 1/10/83

- 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work
  - A. Preliminary

No corrective action identified by the task force.

- EN DES has completed its evaluation of all 10 systems and has determined that there are 9 supports with 1-1/4" # wedge bolts or 1" # grouted anchors that could be adverse conditions if the note was applied. EN DES has sent the list of supports to COMST requesting them to verify whether the note has been used. If the note was used, COMST will provide the exact weld length and size. This data will be used to determine the adequacy of the installation. Redesign and reconstruction will be performed as necessary. These plans are adequate.

  Resp. Org. A. Dest. 513/83 Task Force Concurrence
- 7A. Identification of Corrective Action for Completed Work
  - A. Preliminary

Analyse the adequacy of all generic examples identified under 4 and design and/or reconstruct as necessary.

B. Final
EN DES will evaluate CONST's findings. If the note has been applied, EN DES
will perform the necessary calculations to determine the adequacy of the
substituted welds. If the note has not been used, the support is satisfactory.
Since no other notes of this nature were found to be deficient in step 4, no
further corrective action is required.

Resp. Org. R. D. fatt 1114183 Task Force Concurrence When 1111-183

| 84. | Implementation | and | Inspection | ٥f | Corrective | Acrian | for | Completed | Unek |
|-----|----------------|-----|------------|----|------------|--------|-----|-----------|------|
|     |                |     |            |    |            |        |     |           |      |

A. Preliminary

B. Final

COMST has completed its inspection of all supports identified by EN DES. The results show that none of the supports are installed. (Reference WBN 830523 005)

Resp. Org. R.A. Ratt 76/83 Task Force Concurrence 25/10/83

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

None identified by the task force.

B. Final - Following actions have been taken to alleviate these conditions: (1) EN DES has stopped the use of this note for bolts 1" \$\beta\$ and larger and the drawing note will be revised to limit the applicability of the note; (2) EN DES has issued a construction specification that provides requirements for locating attachments on any embedded plate. This specification (N3C-928) will require a detailed review of connections of this nature.

Resp. Org. R. D. Patt #14/83 Task Force Concurrence 24/10/83

10A. Identification of Corrective Action for Future Work

A. Preliminary

- Revise EN DES EP3.03 to clarify requirements and applicability of calculations for technical notes on design drawings.

- Train all SWP personnel involved in the design and checking of support drawings in the requirements of EN DES EPs 3.03 and 4.25.

B. Final

The plan in 9.A.B is adequate.

Pasp. Org. R. D. Lett 573/83 Task Force Concurrence 2/1/10/83

| la. I      | mplementation                                                                                         | of Corrective Acti                                                                                                                                                  | on for Futur                                                                               | • Work                                                                                                                                            |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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| <b>A</b>   | . Preliminary                                                                                         | •                                                                                                                                                                   |                                                                                            |                                                                                                                                                   |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|            | a surface m<br>embedded pl<br>anchor bolt<br>5/16" fille<br>is provided<br>least one c<br>H3C-928 and | wing 47A050-IT, no counted base plate ate, and that one is in the way of the tweld between the for each omitted enterline of the or G32. This note a D.R.H. 6/29/83 | with anchor lor more of the embedded plantace mous anchor bolt. mitted bolt applies to WB; | colts 7/8" diamete<br>me anchors cannot<br>late may be omitte<br>ated base plate an<br>The weld must co<br>and meet requirement, SSD, SPD and GRO | r or less ov<br>be installed<br>d if at less<br>d the embedd<br>me to or cro<br>nt of specif<br>UTED Bolts o | erlaps of the table of the table of the table of the table of the table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of table of |
| A. V       | erification of                                                                                        | Effectiveness of                                                                                                                                                    | Corrective Ac                                                                              | tion for Future W                                                                                                                                 | ork                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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| В          | . Final                                                                                               | ·<br>·                                                                                                                                                              |                                                                                            |                                                                                                                                                   |                                                                                                              | ÷                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| Re         | esp. Org.                                                                                             | 11                                                                                                                                                                  | _ Task Force                                                                               | Concurrence                                                                                                                                       |                                                                                                              | <i>l:l</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| B. Id      | lentification                                                                                         | and Evaluation of (                                                                                                                                                 | Ongoing Corre                                                                              | ctive Action for                                                                                                                                  | Completed Wo                                                                                                 | rk                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>A</b> . | Preliminary                                                                                           |                                                                                                                                                                     | ,                                                                                          |                                                                                                                                                   |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|            | Final                                                                                                 |                                                                                                                                                                     |                                                                                            |                                                                                                                                                   |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| В.         |                                                                                                       |                                                                                                                                                                     |                                                                                            |                                                                                                                                                   |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| В.         |                                                                                                       |                                                                                                                                                                     |                                                                                            |                                                                                                                                                   |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

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|------------------------|---------------------------------------------------------|
| 73. Identification of  | Corrective Action for Completed Work                    |
| A. Preliminary         |                                                         |
| W/A                    |                                                         |
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| 3. Final               |                                                         |
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| Resp. Org.             | / / Task Force Concurrence / /                          |
| 8B. Implementation and | Inspection of Corrective Action for Completed Work      |
| A. Preliminary         | ·                                                       |
| H/A                    |                                                         |
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| B. Final               |                                                         |
| p. Finel               |                                                         |
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| Resp. Org.             | / _/ Task Force Concurrence/ /                          |
|                        |                                                         |
|                        | Evaluation of Ongoing Corrective Action for Future Work |
| A. Preliminary         |                                                         |
| H/A                    |                                                         |
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| B. Final.              |                                                         |
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| Resp. Org.             | // Task Force Concurrence //                            |

| 108. Identification of Corrective Action for Puture Work               |             |
|------------------------------------------------------------------------|-------------|
| A. Preliminary                                                         |             |
| W/A                                                                    |             |
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| B. Final                                                               |             |
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| Rasp. Org. // Task Force Consumers                                     |             |
| Resp. Org. // Task Force Concurrence                                   |             |
| 1B. Implementation of Corrective Action for Future Work                | <del></del> |
| A. Preliminary                                                         |             |
| #/A                                                                    |             |
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| 3. Final                                                               |             |
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| Resp. Org. // Task Force Concurrence                                   | 1.1         |
| 2B. Verification of Effectiveness of Corrective Action for Future Work |             |
| A. Preliminary                                                         |             |
| H/A                                                                    |             |
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| B. Final                                                               | ,           |
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| Resp. Org. // Task Force Concurrence                                   |             |

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TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R2 Date 2/21/84

- 1. Task-Force Category 19 for Watts Bar Nuclear Plant Unit 2
- Task Force Category Description and Related Watts Bar Nuclear Plant unit 1 B&V Findings: Equipment cannot be determined to be environmentally qualified to NUREG-0588: F140 and F144.
- 3. Evaluation for Cause
  - A. Preliminary
    Watts Bar unit 1:
    The design control process failed to recognize the need to systematically
    environmentally qualify equipment for postulated accidents.
    Watts Bar unit 2:
    This cause appears to be applicable to Watts Bar unit 2.
  - B. Final
    Watts Bar unit 1:
    The design control process failed to recognize the need to systematically environmentally qualify equipment for postulated accidents.
    Watts Bar unit 2:
    This cause appears to be applicable to Watts Bar unit 2.

Resp. Org. MRR leur 6/3/83 Task Force Concurrence 26/6/83

- 4. Evaluation for Generic Examples
  - A. Preliminary

The very nature of the findings does not lend itself to a sample approach for bounding the problem to the unit 1 AFW system. The EN DES equipment qualification program under NUREG-0588 prescribes an adequate approach to identify generic examples for WBN Unit 2.

B. Final

The very nature of the findings does not lend itself to a sample approach for bounding the problem to the unit 1 AFW system. The EN DES equipment qualification program under NUREG-0588 prescribes an adequate approach to identify generic examples for WBN Unit 2.

Resp. Org. MR8 lur 6/3/83 Task Force Concurrence 26 force 6/6/83

# 5. Licensing Basis Satisfaction

#### A. Preliminary

Lack of environmental qualifications for safety related equipment does not satisfy the licensing basis. Some currently known examples have been identified where the equipment was not qualified.

#### B. Finel

Lack of environmental qualifications for safety related equipment does not satisfy the licensing basis. Some currently known examples have been identified where the equipment was not qualified.

Resp. Org. MR Rolus 6/3/83 Task Force Concurrence CIG 183

# 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

# A. Preliminary

EN DES has developed and implemented a comprehensive program to determine environmental qualifications of equipment and correct as necessary, including the documenting of all identified deficiencies via the NCR process. This is an acceptable approach.

#### B. Final

EN DES has developed and implemented a comprehensive program to determine environmental qualifications of equipment and correct as necessary, including the documenting of all identified deficiencies via the NCR process. This is an acceptable approach.

Resp. Org. MR Relear 6/3/83 Task Force Concurrence 6/6/53

# 7A. Identification of Corrective Action for Completed Work

# A. Preliminary

The EM DES environmental qualification program includes appropriate corrective action to verify qualifications or require replacement of previously procured and installed equipment.

## B. Final

The EN DES environmental qualification program includes appropriate corrective action to verify qualifications or require replacement of previously procured and installed equipment.

Resp. Org. MRRs/emb/3/83 Task Force Concurrence Heller 6/6/83

- 8A. Implementation and Inspection of Corrective Action for Completed Work
  - A. Preliminary
  - B. Final

Our engineering procedures and our HUNEG 0588 program are adequate to assure proper handling of systems important to safety.

Resp. Org. MR Balow 6/3/83 Task Force Concurrence

24/h 7 24183

- 9A. Identification and Evaluation of Ongoing Corrective Action for Puture Work
  - A. Preliminary

The Task Force is not aware of any action.

B. Final

Presently there is no identified program to ensure implementation of corrective action for future work. However, a nonconformance report GENERA 8204 has been written on this problem. Our Buclear Engineering 2/2/3/Branch is to resolve this NCR.

Resp. Org. MR Bulaurh 3/86 Task Force Concurrence 26/6/

10A. Identification of Corrective Action for Future Work

A. Preliminary

EN DES needs to revise the design control process to provide environmental qualification of equipment.

B. Final - Our NUREG 0588 program presently provides an adequate identification of environmental qualification requirements for future work. In addition, EP 3.01 has been revised to reference environmental drawings. The Watts Bar design criteria has also been revised. EEB has reviewed the attached "Equipment Qualification Program" and has found it adequate for "corrective action" for NCR GENQAB 8204. The need for an interdivisional procedure has been identified in the "Equipment Qualification Program" and this need has been coordinated with OQA.

Resp. Org. MARaber 2/22/86 Task Force Concurrence

| A. Preliminary       | f Corrective Action for Puture Work          | •                 |
|----------------------|----------------------------------------------|-------------------|
| B. Final             |                                              |                   |
| See item 10A         | •                                            |                   |
| Resp. Org. MA        | 2/22/80 Task Force Concurrence               | 28/15             |
| A. Verification of 1 | Effectiveness of Corrective Action for Futur | e Work            |
| A. Preliminary       |                                              | ,                 |
|                      | ·                                            |                   |
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| . Identification and | d Evaluation of Ongoing Corrective Action fo | or Completed Work |
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| B. Finel                               |                                                                          | ٠    |  |  |  |  |  |  |
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|                                        | Inspection of Corrective Action for Completed World                      | k    |  |  |  |  |  |  |
| A. Preliminary                         |                                                                          |      |  |  |  |  |  |  |
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| B. Final                               |                                                                          | •    |  |  |  |  |  |  |
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| B. Identification and                  | Evaluation of Ongoing Corrective Action for Future                       |      |  |  |  |  |  |  |
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| H/A                                    |                                                                          |      |  |  |  |  |  |  |
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| . Ide | atification of Corrective Action for Future Werk               |                                                   |
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| 3.    | Final                                                          |                                                   |
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| Veri  | fication of Effectiveness of Corrective Action for Future Work | <del>, , , , , , , , , , , , , , , , , , , </del> |
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## EQUIPMENT QUALIFICATION PROGRAM

The need for a comprehensive program to concisely direct and control all activites associated with establishing and maintaining the required level of environmental and functional qualification of safety-related components has become more evident as the work required by IEB79-01B and NUREG-0588 has progressed.

The evaluation work in progress or completed to date has been conducted in compliance with existing procedures that govern specific activities, such as design calculations; however, there has been an absence of an integrated approach to control and insure that the required qualification level of each component is maintained throughout the life of the plant. The proposed programmatic approach to resolve the concerns is depicted by the attached informational flow charts developed to address:

- The completed, current and future activities related to IEB79-01B, NUREG-0558, and 10CFR50.49,
- Any new system that may be added to a plant environmental zone or LOGS.
- The procurement of any safety-related component by EN DES or NUC PR and,
- The installation and maintenance requirements and activities on a component specific basis.

Currently there are 18 Engineering Procedures that govern specific activities associated with equipment qualification. For the proposed program 3 of these will need revision and 7 others need to be developed. One of the 7 will be an interdivisional procedure and one will be an upper tier document addressing the overall program.

The attached listing of existing applicable engineering procedures are indicated on the programmatic flow charts by the number as listed.

EP-4.01 (number 10 on list) requires further consideration for revision to environmental drawings.

EP-5.14 (number 15 on list) requires revision to reflect special handling of vendors qualification test reports.

EP-5.43 (number 18 on list) requires revision to include special handling of qualified items in both vendor shops (waiver approval limitations) and receipt handling at the site.

The detailed review of this proposed program may necessitate some changes to the flow charts and the procedure consideration as now envisioned and these will be incorporated as each need is identified.

The proposed schedule for implementing the plan is as follows:

Finalize plan

Finalize plan

April 13, 1984

Final identification of required revisions
to existing procedures

April 13, 1984

Final identification of new procedures needed

April 13, 1984

Complete draft of new procedures and revisions
to existing procedures

June 15, 1984

Issue new procedures

October 15, 1984

Implementation November 1, 1984

The above schedule was developed unilaterally and is subject to revision as the work progresses and will be dependent to a degree on priority considerations of those involved.

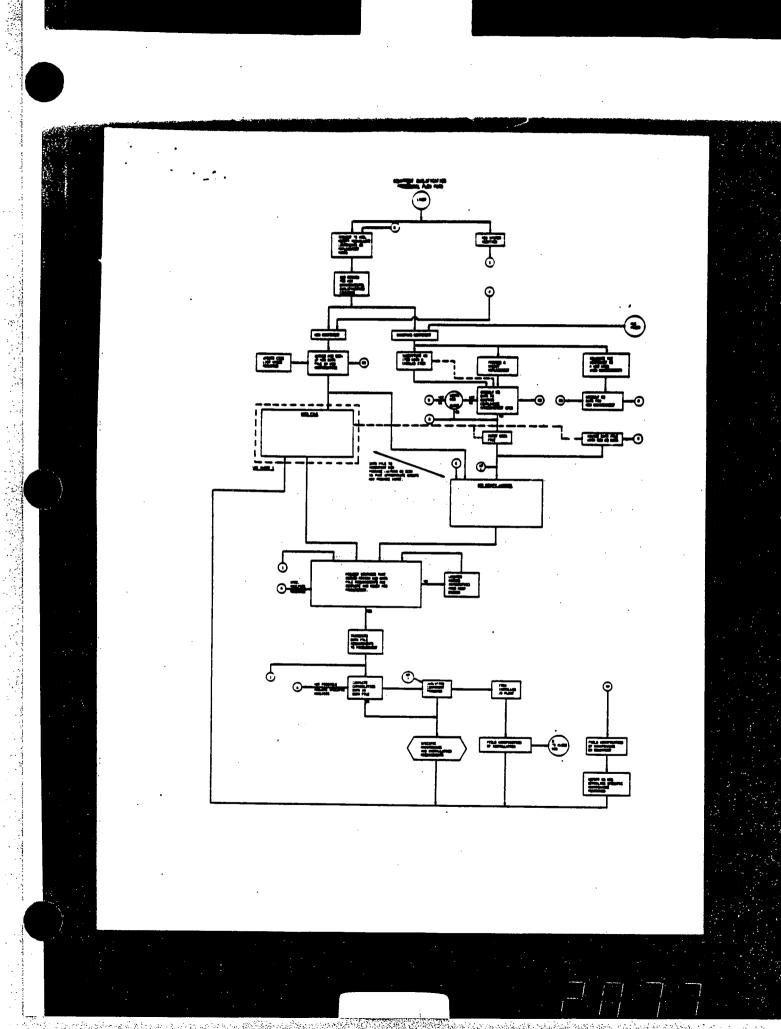
New procedures potentially required are indicated by asterisks in the blocks of the programmatic flow chart as rollows:

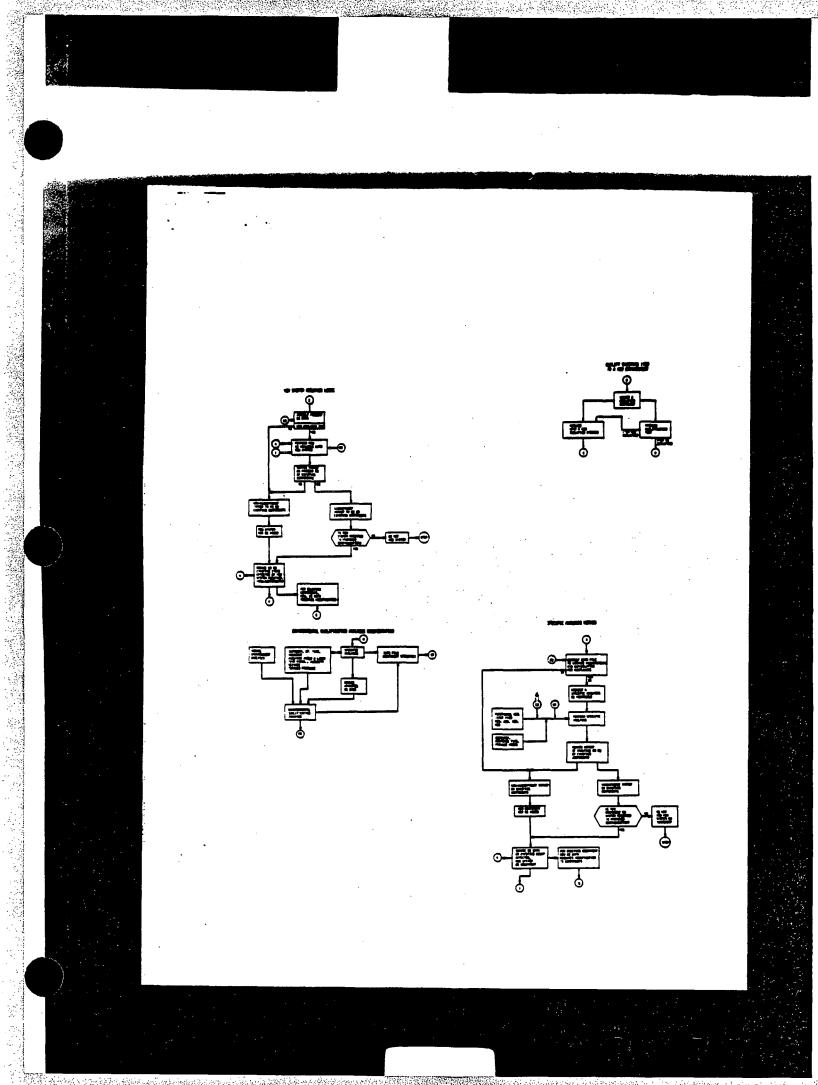
- (\*) To cover input, use and revision of the data base
- (A\*) An interdivisional procedure to cover field varification of installation and maintenance activities for input to the data base and for closure of an HCR (if one is issued)
- (B\*) To cover review for impact on existing system components, etc., resulting from new system addition in an existing environmental sone
- (C\*) To cover qualification testing
- (D\*) To cover "refined" analysis for a specific component in an existing environmental zone
- (E\*) To cover the structure of the data base
- (F\*) An upper tier procedure or document to define the overall program

# ATTACHMENT EXISTING PROCEDURES

- 1. NCR's Reporting and Handling (EP-1.26)
- 2. Control to Documents Affecting Quality (EP-1.28)
- TVA Homorandums Transmitting Quality Information Handling in EN DES (EP-1.50)
- 4. Handling of Conditions Potentially Reportable Under Title 10 CFR Part 21, 50.36, and 50.55(e) (EP-2.02)
- 5. Design Criteria Documents (EP-3.01)
- 6. Seismic Design, Review and Control (EP-3.02)
- 7. Design Calculations (EP-3.03)
- Design Verification Hethods and Performance of Design Verifications (EP-3.10)
- 9. QA List Preparation and Handling (EP-3.48)
- Signatures/Initials for Preparation, Review, and Approval of EM DES Drawings (EP-4.01)
- Engineering Change Notices (ECH's) before Licensing Handling (EP-4.02)
- 12. Field change Requests Initiated by NUC PR (EP-4.06)
- Design change Requests (DCR's) Processing, Reviewing, and Approving (EF-4-18)
- 14. Engineering Change Notices (ECNs After Licensing Handling (EP-4.52)
- 15. Vendor Documents Handling and Disposition (EP-5.14)
- 16. Processing Procurement Requests (EP-5.20)
- 17. Procurement Quality Assurance (EP-5.33)
- Release of QA Items from Suppliers' Shops to Construction Site (EP-5.43)

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TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHRET

Rev. R2 Date 11/9/8

- 1. Task Force Category 20 for Watts Bar Nuclear Plant Unit 2
- Task Force Category Description and Related Watts Bar Nuclear Plant unit 1 B&V
   Findings: No procedure for documenting time delay relay settings that are determined
   by preoperational test and the preoperational test did not identify or require the
   documenting of these settings: F113, F125, F126, F132 and F801.
- 3. Evaluation for Cause
  - A. Preliminary
    Watts Bar unit 1:
    The written design control process did not identify and control the time delay
    relay settings.
    Watts Bar unit 2:
    This cause appears applicable to Watts Bar unit 2.
  - B. Final

Same as above

Resp. Org. MRR. sleer 7/21/83 Task Force Concurrence 2/2/1-9/2483

- 4. Evaluation for Generic Examples
  - A. Preliminary
    Watts Bar unit 1:
    This deviation applies to all systems at that require time delay relay settings.
    Watts Bar unit 2:
    This deviation applies to all systems at that require time delay relay settings.
  - B. Final

Same 1

Resp. Org. MR Below 9/21/83 Task Force Concurrence William 724/83

## 5. Licensing Basis Satisfaction

A. Preliminary

Based on the cause in 3, the licensing basis for these time delay relays was not satisfied.

3. Final

Same as above

Resp. Org. MR Relaw 7/2//83 Task Force Concurrence 2// 9/21/83

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminery

The HCR WHERE 8301 has been written to identify the Black and Beatch finding, however no corrective action has been identified.

Final The preoperational tests are being updated to include the setting and recording of the time delay relay settings. Special Engineering Procedure EN DES-SEP 83-11 is being written to have the time delay settings put on the drawings. Interim memo (KEB 830614 939) was written to document the relay settings.

Resp. Org. MR Behar 7/2//83 Task Force Concurrence 1/6 9 126/83

7A. Identification of Corrective Action for Completed Work

A. Preliminary

The corrective action identified under item 10A should be backfitted for all time delay relays.

B. Finel

Same as above

Resp. Org. MR Below 7 /21/83 Task Force Concurrence 2/ 9/24/83

- 8A. Implementation and Inspection of Corrective Action for Completed Work
  - A. Preliminary
  - B. Final

All time delay settings determined by preoperative test prior to issuance of interim memorandum (EEB 830614 939) were adequately documented. Preop test TVA-22 scoping document has been changed (NEB 821130 276) and SEP 83-11 has been issued to require documentation of all TD settings determined after June 14, 1983. These settings will be reviewed by EN DES after TVA-22 is rerun. This corrective action is not completed but will be tracked by the preop program and EN DES-SEP 83-11 through completion.

Resp. Org. MRBelow | 1/0/83 Task Force Concurrence 2/// 1/10/83

- 9A. Identification and Evaluation of Ongoing Corrective Action for Future Work
  - A. Preliminary

The task force is not aware of any action.

B. Final

Special Engineering Procedure EN DES-SEP 83-11 is being written to include the delay relay settings in the preoperation tests.

Resp. Org. 71 RB. Jun 9/2//83 Task Force Concurrence 2/6 9/26/83

- 10A. Identification of Corrective Action for Future Work
  - A. Preliminary

EN DES should establish control of time delay relay settings within the design control process.

B. Final

Special Engineering Procedure EN DES-SEP 83-11 will provide adequate control to assure proper documentation of the time delay relay settings.

Resp. Org. MR Bally 9/4/83 Task Force Concurrence 2/6/83

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| IIA. Implementation of | Corrective Act | ion for Future Work | <b>L</b>         |            |
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| B. Finel               |                |                     |                  |            |
|                        | 11 /999 931014 | 937) has been issue |                  |            |
| PU 199-3EL 61-         | TT (PEP 03TOT4 | 93/) has been issue | ed.              |            |
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| 2A. Verification of Ef | fectiveness of | Corrective Action   | for Patrice Work |            |
| A. Preliminary         |                |                     | ror service work | •          |
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| B. Final               |                |                     |                  |            |
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| 58. Identification and | Evaluation of  | Ongoing Corrective  | Antina for Com   | 1          |
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| B. Final               |                |                     |                  |            |
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| 73. Identification of ( | brrective Action for Completed No. | rk                    |
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| A. Preliminary          |                                    |                       |
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|                         | Inspection of Corrective Action fo | r Completed Work      |
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| B. Identification and B | valuation of Ongoing Corrective Ac | ction for Puture Work |
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| H/A                     | •                                  |                       |
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| 10B. Identification of Corrective Action for Future Work          |          |
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| 11B. Implementation of Corrective Action for Future Work          |          |
| A. Preliminary                                                    |          |
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| B. Final                                                          |          |
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| 2B. Verification of Effectiveness of Corrective Action for Future | re liork |
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TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R1 Date 8/31/83

- 1. Task Force Category 23 for Watts Bar Nuclear Plant Unit 2
- 2. Task Force Category Description and Related Watts Bar Nuclear Plant unit 1 B&V Findings: Auxiliary feedpump turbine trip and throttle valve FCV-1-51 is not included in the active valve list. The design of the valve schematic does not include the required control room bypass and test indication, nor automatic bypass of the "open" torque switch: F128, F133.
- 3. Evaluation for Cause
  - A. Preliminary
    Watts Bar unit 1:
    Lack of control during the determination of safety-related equipment. This process
    did not employ design verification.
    Watts Bar unit 2:
    This cause appears to be applicable to Watts Bar unit 2.
- B. Final
  The failure to include the sumiliary feedwater turbine trip and throttle valve PCV-1-51 on the active valve list was an isolated error. This list was prepared in 1974 using specific selection criteria. Also, the list was reviewed within EN DES and comments were received through the squadchecking process. After resolution of all comments, the list was listed by mean. The subject valve was initially on the list but was removed during the review process due to an error in evaluating the functions of the valve.

  Resp. Org. 17/13 Task Force Concurrence 9/1/153
  - 4. Evaluation for Generic Examples
    - A. Preliminary

The identified cause does not lend itself to a sample approach for bounding the problem to unit 1 AFW. A review of the FSAR active valve list needs to be performed to verify it includes all appropriate components.

3

B. Final

This is not a generic problem associated with the active valve list as shown by the evaluation in item 3. The FSAR active valve list will be reviewed and updated as required during the FSAR review process described in the task force category 4.

Resp. Org. UTCheff 917183 Task Force Concurrence 24 917183

| 5. | Licensing | Resis | Satiafa | etion |
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|    |           |       |         |       |

A. Preliminary

Based on the cause identified in item 3, the licensing basis does not appear to be satisfied.

B. Final

Since valve FCV-1-52 will be modified, the licensing bases for the plant has been satisfied.

Resp. Org. OTClift 9/7/83 Task Force Concurrence 24/ 9/7/83

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

The task force is not aware of any action.

B. Final

No additional corrective action is required, but the FSAR will be reviewed and revised as described in item 4 above.

Resp. Org. OT Clyt 717183 Task Force Concurrence 246 717183

7A. Identification of Corrective Action for Completed Work

A. Preliminary

MEB needs to revise the FSAR active valve list. Satisfaction of IE Circular 81-13 needs to be accomplished for any other examples identified under 4.

B. Final

The FSAR active valve list will be reviewed per item 4 above. If additional discrepancies are identified, the required modifications will be identified for corrective action. Valve FCV-1-51 will be modified per the Black & Veatch findings as identified in WBN ECN 3642.

Resp. Org. OTCLH 917/83 Task Force Concurrence 2/10/83

| 84. | Implementation | and Inspection | m of Corrective | Action for | r Completed Work |
|-----|----------------|----------------|-----------------|------------|------------------|

A. Preliminary

#### B. Final

WRM BCN-3642 has been issued to implement corrective action on valve FCV-1-51 which was identified during the Black & Veatch review. Any additional discrepancies identified during the review per item 4 will be documented and handled in a similar manner.

Resp. Org. OTCLIFF 917183 Task Force Concurrence 2/183

## 9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

#### A. Preliminary

The task force could not identify any action in place to correct.

## B. Finel

No additional corrective action is required based on the information provided in items 3, 4, and 5.

Resp. Org. Dilly 9/7/83 Task Force Concurrence 26 9/7/83

## 10A. Identification of Corrective Action for Future Work

#### A. Preliminary

The responses to IE Bulletins, Circulars, and Hotices need to be based upon current controlled lists.

#### B. Final

Each IE bulletin, circular, or notice should be evaluated upon receipt to determine the most appropriate method for evaluation. In regard to the active valve list, this list will be reviewed and updated if required per item 4 and will be maintained in the future as the plant design changes; therefore, this specific list will be a current controlled list. IE bulletins, circulars, and notices are handled within EM DES by EP 2.10 and are identified on the TROI system for tracking purposes.

Resp. Org. OTCLAT 917183 Task Force Concurrence 24 717183

| w. Tahiamatetion  | of Corrective Action for                                                              | Future Work        |                                   |                      |
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| A. Proliminar     | <b>,</b>                                                                              |                    |                                   |                      |
| B. Final          |                                                                                       |                    |                                   |                      |
| ATCUTU 🛅          | ng corrective action on fu<br>DES (such as NCRs, ECMs, a<br>current as the design pro | itc.). Item 10 add | handled by iss<br>dresses how the | ued proce<br>list wi |
| Resp. Org.        | Telft 9 17 183 Task                                                                   | Force Concurrence  | 24/                               | <u>-91719</u>        |
| . Verification of | Effectiveness of Correct                                                              | ive Action for Fu  | ture Work                         |                      |
| A. Preliminary    |                                                                                       | -                  | •                                 |                      |
|                   |                                                                                       |                    |                                   |                      |
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| B. Final          |                                                                                       |                    | •                                 |                      |
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| Resp. Org.        | /Task                                                                                 | Force Concurrence  |                                   |                      |
| Identification    | and Evaluation of Ongoing                                                             | Corrective Action  | for Completed                     | Work                 |
| A. Preliminary    |                                                                                       |                    |                                   |                      |
| H/A               |                                                                                       |                    |                                   |                      |
|                   |                                                                                       |                    | •                                 |                      |
| B. Final          |                                                                                       |                    |                                   |                      |
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| B. Identification of | Corrective Act  | ion for Completed Work  |                 |     |
|----------------------|-----------------|-------------------------|-----------------|-----|
| A. Preliminary       |                 |                         |                 |     |
| N/A                  |                 |                         | ~~~             | -   |
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| B. Final             |                 |                         |                 |     |
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| Resp. Org.           |                 | Task Force Concurre     | 166             |     |
| B. Implementation an | d Inspection of | Corrective Action for   | Completed Work  |     |
| A. Preliminary       |                 |                         |                 |     |
| H/A                  |                 |                         |                 |     |
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| B. Final             |                 | ·                       |                 |     |
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| . Identification and | i Evaluation of | Ongoing Corrective Acti | on for Future W | ork |
| A. Preliminary       |                 |                         |                 |     |
| H/A                  |                 |                         |                 |     |
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| B. Final             |                 |                         |                 |     |
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TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R2 Date 12/16/8:

- 1. Task Force Category 25 for Watts Bar Nuclear Plant Unit 2
- Task Force Category Description and Related Watts Bar Nuclear Plant unit 1 36V Findings:

Flange evaluations were omitted in some analysis calculations: F322.

- 3. Evaluation for Cause
  - A. Preliminary

Watts Bar unit 1: Flange qualifications were not always done by calculations or other documented means. Qualification of these flanges by detailed calculations was not considered necessary.

Watts Bar unit 2: This cause appears to be applicable to Watts Bar unit 2.

B. Final

Flange qualification was deleted from one of the evaluated AFW problems. Checklists indicated those flange qualifications were required. The summary for this specific problem indicated that there were no flanges which required qualification. Analysts were aware of the need to qualify the flanges by detailed calculations. This type of error is largely contributed to individual error, inexperienced personnel, and the fact that some of the initial analyses was conducted prior to the quality control that is presently utilized.

Resp. Org. 75 Commer 12/87 Task Force Concurrence 2/15/84

- 4. Evaluation for Generic Examples
  - A. Preliminary

Flange qualification needs to be reviewed for all rigorous analysis problems for WBN 2.

B. Final

Flange qualification is presently being reviewed for all rigorous analyses for WBN. (Several other deletions have been identified.)
The review has been completed and 35 problems have been identified for which the flanges qualification had not been documented in the analysis.

Resp. Org. 72 Guin 12/5/89 Task Force Concurrence 11/5/84

| 5. Licensing Basis | . Setiefection |
|--------------------|----------------|
|--------------------|----------------|

## A. Preliminary

Until all flanges have been evaluated and qualification determined the potential exists that the licensing basis was not satisfied.

#### B. Final

Licensing basis is satisfied thus far since the B&V finding and the corrections made to date have not identified any examples of flanges where failure could occur or stress allowables could be exceeded. Until all flanges are evaluated, as in 4.8., there exists a slight potential that the licensing basis was not satisfied. (See Continuation Sheet, page 7)

Resp. Org. 72 Communication | 15/84 .

# 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

#### A. Preliminary

The current planned corrective action for WBNCES 8222 (not yet documented) appears acceptable to identify and correct all examples at WBN 2.

### B. Final

The current planned corrective action for WBNCEB 8222 (a 100-percent review of all WBN problems to assure proper documentation of flange qualification) appears adequate to correct all completed work at WBN.

Resp. Org. 72 Cm.: 12/29/83 Task Force Concurrence 15/84

# 7A. Identification of Corrective Action for Completed Work

#### A. Preliminary

Calculations need to be performed to qualify all the flanges in the rigorous analysis problems.

## B. Final

The plan in 6A appears adequate.

Resp. Org. TE Comme E/27/25 Task Force Concurrence 115/89

- 8A. Implementation and Inspection of Corrective Action for Completed Work
  - A. Preliminary
  - B. Final A 100 percent review of all flanges is in progress. Thirty-five problems were identified for which flange qualifications had not been included in the analysis package. The flanges will be evaluated to determine if they are qualified. Documentation will be upgraded prior to April 1, 1985. This effort is being tracked through HCR WBMCKB 8222. (See Continuation Sheet, page 7)

Resp. Org. 72 Commission | 12/83 Task Force Concurrence 1/5/84

- 9A. Identification and Evaluation of Ongoing Corrective Action for Future Work
  - A. Preliminary

Task force is not aware of any action.

B. Final

The latest checklist precisely notifies the analyst of the requirements for the proper flange qualification and documentation. The checklist is presently identified in J. E. McCord's memorandum to CEB Files (CEB 821006 003) and will be incorporated into the WBN rigorous analysis handbook.

Resp. Org. 72 Company Task Force Concurrence 2115184

- 10A. Identification of Corrective Action for Future Work
  - A. Preliminary

Specify and implement criteria for demonstration of flange qualification.

B. Final

The action identified in 9.A.B appears to be adequate.

Resp. Org. 72 (29/87 Task Force Concurrence 1/5/84

|            | <b>A.</b> | Preliminary                                                                                                                                                    |    |
|------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
|            | В.        | Final  A checklist which includes requirements for proper flange qualification and documentation has been incorporated into the WBH rigorous analysis handbook | •  |
|            |           | p. Org. 72 /2/27/73 Task Force Concurrence Off 1/51                                                                                                            | 83 |
| <b>2A.</b> |           | ification of Effectiveness of Corrective Action for Future Work                                                                                                |    |
|            | Α.        | Preliminary                                                                                                                                                    |    |
|            |           |                                                                                                                                                                |    |
|            | В         | Final                                                                                                                                                          |    |
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| 6B.        |           | ntification and Evaluation of Ongoing Corrective Action for Completed Work Preliminary                                                                         |    |
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| 78.         | Identification of  | Corrective Act  | ion for Come  | ared Host           |            |
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|             | N/A                |                 |               |                     |            |
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|             | B. Final           |                 |               |                     |            |
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| 8 <b>B.</b> | Implementation and | i Inspection of | Corrective A  | ction for Complete  | d Mank     |
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| 9B.         | Identification and | Evaluation of   | Ongoing Corre | ective Action for I | uture Work |
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| 108. | de lification of  | Corrective Action for Future Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |    |
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|      | A. Preliminary    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |    |
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| 113. | Implementation of | Corrective Action for Future Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |    |
|      | A. Preliminary    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |    |
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|      | B. Final          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |    |
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| 23.  | Verification of E | ffectiveness of Corrective Action for Future Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |    |
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|      | B. Final          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |    |
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TVA Task Force for Review of Black & Veatch Findings

BLACK & VEATCH EVALUATION SHEET (Continuation Sheet)

- 5. Licensing Basis
  - B. Final (continued)

Note from Task Force: Determination of the licensing basis satisfaction is not required for the purpose of task force's review of this category since the responsible organisation has committed to a 100 percent review and corrective action for future work has been implemented. The results of the review will be tracked under nonconformance WBNCEB 8222.

- 8. Implementation and Inspection of Corrective Action for Completed Work
  - B. Final (continued)

Note from Task Force: Determination of the licensing basis satisfaction is not required for the purpose of task force's review of this category since the responsible organization has committed to a 100 percent review and corrective action for future work has been implemented. The results of the review will be tracked under nonconformance WBNCEB 8222.

TVA Task Force for Meview of Black & Veaton Findings

EVALUATION SHEET

Rev. R2 Date 3719/84

- 1. Task Force Category 30 for Watts Bar Nuclear Plant Unit 2
- Task Force Category Description Related Watts Bar Nuclear Plant unit 1 B&V
  Findings: Failure to satisfy design criteria for 1) monitoring operability and 2)
  providing adequate electrical protective devices for the motor driven auxiliary feed
  water pump lube oil pump: 1) F100 and 2) F130
- 3. Evaluation for Cause
  - A. Preliminary
    Watts Bar unit 1: 1) and 2) SWP failed to adequately design and/or review the
    design of safety system support equipment which operates full time with respect to
    criteria for status monitoring and electrical protection. The cause is not
    clearly understood but was due to inadequate implementation of existing design
    control requirements.
- 4. Evaluation for Generic Examples
  - A. Preliminary
    - and 2) A review needs to be performed of all WBN unit 2 designs involving full.
       time operating equipment which supports the operability of safety related equipment to identify generic examples where status monitoring and/or electrical protection were not satisfied.
  - B. Final 1) A generic review will be conducted after a procedure is developed specifying how NUC PR and EN DES will exchange information regarding maintenance schedules for plant equipment.
    2) Review of all full-time operating equipment supporting safety-related equipment determined only one other similar type device was inadequately protected: Aux FW pump valve electro-hydraulic actuators (1-MTR-3-122-A, 1-MTR-3-132-B) (Ref: Memo from C. C. Fisher to WBP Files dated June 10, 1983 (WBP 830610 032).

Resp. Org. 9.0. Collin 3/19/24 Task Force Concurrence 3/19/84

# 5. Licensing Basis Satistaction

- - 1) The licensing basis was not satisfied since the ND AFP lube oil pump was expected to be deliberately made inoperable more frequently than annually, hence requiring status monitoring.
  - 2) The licensing basis was not satisfied since neither the MD AFP lube oil pump motor nor its cable were adequately protected as specified in FSAR 8.3.1.1.
- - 1) Licensing basis is satisfied for the MD AFP lube oil pump since it has been added to status monitoring on EUN 3827.
  - 2) The licensing basis was not satisfied since the MD AFP lube oil pump motor and its cable were not adequately protected as specified in FSAR 8.3.1.1.

Resp. Org. 9. B. Colling 3/19/84 Task Force Concurrence

- 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work
  - A. Preliminary
    - 1) The task force is not aware of any action.
    - 2) ECN 3636 identifies F-136 and commits to addition of appropriate electrical protection.
  - B. Final
    - 1) ECN 3827 added MD AFW lube oil pump to status monitoring (Ref: EM DES response to finding F-100).
    - 2) ECN 3636 referenced F-136. It also included generic examples specified in 4A.

Resp. Org. 9.0. College 3/19/84 Task Force Concurrence 3 <u>119184</u>

- 7A. Identification of Corrective Action for Completed Work
  - A. Preliminary
    - 1) and 2) Addition of appropriate electrical protection and/or status monitoring is needed for all deviations generically identified under 4.
  - B. Final
    - 1) Generic examples, if found, will be corrected after review in item 4 is complete.
    - 2) Generic deviations included in ECN 3636.

Resp. Org. G. C. College 3 //9/84 Task Force Concurrence

- 8A. Implementation and Inspection of Corrective Action for Completed Work
  - A. Preliminary
  - B. Finel
    - (1) CTR R294 will track the completion of past work by reviewing the maintenance schedule to determine if the requirements of status monitoring in RG 1.47 are met. Any deficiencies will be corrected.
    - (2) ECN 3636 has been completed (SWP 830303 618).

Resp. Org. 95. Colles 8/9/84 Task Force Concurrence 2/1 3/7/84

- 9A. Identification and Evaluation of Ongoing Corrective Action for Future Work
  - A. Preliminary
    - 1) and 2) The task force is not aware of any action.
  - B. Final
    - 1) Procedure will become part of the Office of Power and Engineering issued and controlled documents and will be reviewed periodically per Engineering Procedures Training and Utilization Program (Ref: memorandum from M. N. Sprouse to Those listed dated February 26, 1982 (NEB 820226 255).
  - 2) Engineering Procedures Training and Utilization Program initiated by M. M. Sprouse to Those listed dated February 26, 1982 (NEB 820226 255).

    Resp. Org. 9. 1. (1984) 3 /19/84 Task Force Concurrence 3 /19/84
- 10A. Identification of Corrective Action for Future Work
  - A. Preliminary
    - 1) and 2) More definitive causes must be established in 3 in order to identify appropriate actions to improve future work.
  - B. Final
    - 1) Procedures will become part of EN DES issued and controlled documents and will be reviewed periodically per Engineering Procedures Training and Utilization Program (Ref: memorandum from M. N. Sprouse to Those listed dated February 26, 1982 (NRB 820226 255).
    - 2) Engineering Procedures Training and Utilization Program initiated by M. M. Sprouse to Those listed dated February 26, 1982 (NEB 820226 255).

Resp. Org. 9.5. (Ollow 3/19/84) Task Force Concurrence 2/1/2 3/19/84

| Implementation of Corrective Action for Future Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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| A. Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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| (1) CTR R294 will track the completion of issuing a procedure equipment changed in the future is reviewed for compliance to a requirements of RG 1.47.  (2) The completion of training is a second to the completion of training is a second to the completion of training is a second to the completion of training is a second to the completion of training is a second to the completion of training is a second to the completion of training is a second to the completion of training is a second to the completion of training is a second to the completion of training is a second to the completion of training is a second to the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the completion of the co | tatus monitoring                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| Task Force Concurrence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3/19/84                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Verification of Effectiveness of Corrective Action for Future Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| A. Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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| B. Final                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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| Resp. Org. / / Task Force Concurrence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Identification and Evaluation of Ongoing Corrective Action for Compl                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | eted Vork                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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| o. Final                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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|-----|---------------------|-------------------------------------------------------|-----------------------------------------|
| 7B. | Identification of C | orrective Action for Completed Work                   |                                         |
|     | A. Preliminary      |                                                       |                                         |
|     | •                   |                                                       |                                         |
|     | N/A                 |                                                       |                                         |
|     |                     |                                                       |                                         |
|     |                     |                                                       |                                         |
|     | B. Final            |                                                       |                                         |
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|     | Resp. Org.          | // Task Force Concurrence                             | 11                                      |
|     |                     |                                                       |                                         |
| OB. |                     | Inspection of Corrective Action for Completed Work    |                                         |
|     | A. Preliminary      |                                                       |                                         |
|     | N/A                 |                                                       |                                         |
|     |                     |                                                       |                                         |
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|     | B. Final            |                                                       |                                         |
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|     | Resp. Org.          | / / Task Force Concurrence                            | , ,                                     |
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| 9B. | Identification and  | Evaluation of Ongoing Corrective Action for Future Wo | rk                                      |
|     | A. Preliminary      | •                                                     |                                         |
|     | -                   |                                                       |                                         |
|     | M/A                 | •                                                     |                                         |
|     |                     |                                                       |                                         |
|     |                     |                                                       |                                         |
|     | B. Finel            |                                                       |                                         |
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|------|-----|---------------------------------------|--------------------------------|-----|
| 108. | Id  | entification of Corrective Action     | for Future Work                |     |
|      | ٨.  | Preliminary                           |                                |     |
|      |     | M/A -                                 |                                |     |
|      |     |                                       |                                |     |
|      |     |                                       |                                |     |
|      | В.  | Finel                                 |                                |     |
|      |     |                                       |                                |     |
|      |     |                                       |                                |     |
|      |     | ·                                     |                                |     |
|      | Res | sp. Org. / /                          | Task Force Concurrence         |     |
| 118. | Imp | plementation of Corrective Action     | for Future Work                |     |
|      |     | Preliminary                           |                                |     |
|      |     | N/A                                   |                                |     |
|      |     | ···                                   | •                              |     |
|      |     |                                       |                                | •   |
|      | в.  | Final                                 |                                | •   |
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| 12B. | Ver | ification of Effectiveness of Co      | rrective Action for Future Wor | rk  |
|      | A.  | Preliminary                           |                                |     |
|      |     | N/A                                   | •                              |     |
|      |     |                                       |                                |     |
|      |     |                                       | •                              |     |
|      | В.  | Final                                 |                                |     |
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TVA Task Force for Review of Black & Veetch Findings

EVALUATION SHEET

Nov. El Date 4/27/83

- 1. Task Force Category 31 for Matts Bar Buclear Plant Unit 2
- 2. Task Force Category Description and Related Watts Ber Nuclear Plant unit 1 36V Findings: Editorial discrepancies in licensing documents: F119 and F321.
- 3. Evaluation for Cause
  - A. Preliminary
    Watts Bar unit 1:
    The preparation process and checking through OEDC and Power Regulatory Staff did not identify and correct all editorial discrepancies.
    Watts Bar unit 2:
    This cause appears to be applicable to Watts Bar unit 2.
  - B. Finel

Both findings describe FSAR errors that are editorial in nature.

Resp. Org. DT Clift 4127/83 Task Force Concurrence Walter 427/83

- 4. Evaluation for Generic Examples
  - A. Preliminary

The low editorial error rate found in unit 1 AFW commitments combined with their lack of plausible negative impact does not warrant an evaluation for generic examples at this time.

B. Finel

No further evaluation is required.

Resp. Org. DTCLG 417183 Task Force Concurrence 412783

| 5. Li   | consing Basis Satisfaction                                                                                                                                                                                                                                                                                                                                                      |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4.      | Proliminary                                                                                                                                                                                                                                                                                                                                                                     |
|         | The editorial nature of the FSAR errors does not jeoperdise the licensing basi defined in the FSAR. Therefore, no further action required.                                                                                                                                                                                                                                      |
| 3.      | Final The findings do not represent conditions that compromise the licensing basis for the plant. Therefore, no further action on this category of findings is required. However, it should be noted that corrective action taken/planned as a result of the category 4 findings will serve to correct FSAR errors of this assessment is applicable to both units at Watts Bar. |
| Res     | 10. Oct. 197/1/2 4129/82 10/                                                                                                                                                                                                                                                                                                                                                    |
|         | Task Force Concurrence 127 83                                                                                                                                                                                                                                                                                                                                                   |
| SA. Ide | matification and Evaluation of Occasion Communication                                                                                                                                                                                                                                                                                                                           |
|         | entification and Evaluation of Ongoing Corrective Action for Completed Work  Preliminary                                                                                                                                                                                                                                                                                        |
| . –     |                                                                                                                                                                                                                                                                                                                                                                                 |
|         | <b>1/A</b>                                                                                                                                                                                                                                                                                                                                                                      |
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| B.      | Pinal -                                                                                                                                                                                                                                                                                                                                                                         |
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| ~==1    | p. Org. // Task Force Concurrence //                                                                                                                                                                                                                                                                                                                                            |
| A Tdor  |                                                                                                                                                                                                                                                                                                                                                                                 |
|         | ntification of Corrective Action for Completed Work                                                                                                                                                                                                                                                                                                                             |
| Δ.      | Preliminary                                                                                                                                                                                                                                                                                                                                                                     |
|         | N/A                                                                                                                                                                                                                                                                                                                                                                             |
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| 3.      | Final                                                                                                                                                                                                                                                                                                                                                                           |
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|         | o. Org / / _ Task Force Concurrence / /                                                                                                                                                                                                                                                                                                                                         |

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|------|------------|---------------|-----------------------------------------|---------------|-----------------|-------------|-----|
| 84   | . Im       | plementation  | and Inspection of                       | Corrective As | tion for Comple | ted Work    |     |
|      |            | Preliminary   |                                         |               |                 |             |     |
|      |            | M/A           |                                         |               |                 |             |     |
|      |            |               |                                         |               |                 |             |     |
|      |            |               |                                         |               |                 |             |     |
|      | 3.         | Final         |                                         |               |                 |             |     |
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|      |            |               | <b>i</b>                                |               | •               |             |     |
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|      | Rec        | 19. Oct       |                                         | Task Force    | Concurrence     |             |     |
| 94   | Tde        | meidianais :  | and Braining Co.                        |               |                 |             |     |
| 744  |            |               | md Evaluation of 0                      | mgoing Correc | tive Action for | r Puture Wo | rk  |
|      | <b>A</b> o | Preliminary   |                                         |               |                 |             |     |
|      |            | W/A           | •                                       |               |                 | *           |     |
|      |            |               | ,                                       |               |                 |             |     |
|      | 1.         | Final         |                                         | • •           | • • •           | ,           |     |
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|      | Res        | p. Org        | / /                                     | Task Force    | Concurrence     |             | , , |
|      |            |               |                                         |               | Operations      |             |     |
| 104. | Ide        | atification o | f Corrective Action                     | n for Puture  | Work            |             |     |
|      | <b>A.</b>  | Preliminary   |                                         |               |                 |             |     |
|      |            | H/A           |                                         |               |                 | -           |     |
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|      | в.         | Final         |                                         |               |                 |             |     |
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| A. Implementation of | Corrective Act | ica for Future Work          |                  |
|----------------------|----------------|------------------------------|------------------|
| A. Preliminary       |                |                              |                  |
| W/A                  |                |                              |                  |
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| B. Finel             |                |                              |                  |
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| Resp. Org.           |                | Task Force Concurrence       |                  |
| A. Verification of E | fectiveness of | Corrective Action for Futur  | e Work           |
| A. Preliminary       |                | ,                            |                  |
| W/A                  |                |                              |                  |
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| B. Final             |                |                              | •                |
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| Resp. Org.           |                | _ Task Force Concurrence _   |                  |
| . Identification and | Evaluation of  | Ongoing Corrective Action fo | r Completed Work |
| A. Preliminary       |                |                              |                  |
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| B. Final             |                |                              | • • • • •        |
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| 73. Identification | of Corrective Act | ion for Completed | Work              |          |
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| A. Proliminar;     | 7                 |                   |                   |          |
| T/A                |                   |                   |                   |          |
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| B. Final           |                   |                   |                   |          |
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| map. Org           |                   | Task Force Co     | ncurrence         |          |
| 3. Implementation  | and Inspection of | Corrective Action | B for Completed W |          |
| A. Preliminary     |                   |                   |                   | VIB ·    |
| W/A                |                   |                   | •                 |          |
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| B. Finel           |                   | •                 | ·                 |          |
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| Resp. Org.         |                   | _ Task Force Con  | currence          | 11       |
| 3. Identification  | and Evaluation of | Ongoing Correctiv | e Action for Puty | tra Work |
| A. Preliminary     |                   |                   |                   |          |
| H/A                |                   |                   | •                 |          |
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| 103. Identification of   | Corrective Actio | on for Peture Hor  | <b>t</b>        |   |
|--------------------------|------------------|--------------------|-----------------|---|
| A. Preliminary           |                  |                    |                 |   |
| W/A                      |                  |                    |                 |   |
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| B. Final                 |                  |                    |                 |   |
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| Resp. Org.               |                  | Task Force Cone    | urrence         |   |
| 113. Implementation of ( | brrective Actic  | - for Pursua Visit |                 |   |
| A. Preliminary           |                  | m for larging MOLI |                 |   |
| W/A                      |                  |                    |                 |   |
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| B. Final                 |                  | ,                  |                 |   |
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| Resp. Org.               | , ,              |                    |                 |   |
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| 2B. Verification of Eff  | ectiveness of Co | Frective Action    | for Future Work |   |
| A. Preliminary           |                  |                    |                 |   |
| W/A                      | •                |                    |                 |   |
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| B. Final                 |                  |                    |                 |   |
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TVA Task Force for Review of Black & Veatch Findings

EVALUATION SERRE

Lev. Date 12/19/83

519183

- 1. Task Force Category 32 for Watta Bar Huclear Plant Unit 2
- 2. Task Force Category Description and Related Watts Bar Buclear Plant unit 1 36V Findings: Incompatible hanger drawings and piping isometric drawings: 7753, 7858, 7865, 7866, 1932, 1939, 1942, 1976, 1983.
- 3. Evaluation for Cause
  - A. Preliminary

Watts Bar unit 1:

- Inadequate drawing checking and design verification prior to issuance.
- Inadequate recognition of need to revise companion drawings during design change Drocess.

Watts Bar unit 2:

- These causes appear to be applicable to Watts Bar unit 2.
- B. Finel

The following causes are identified for completed unit 2 work:

- Inadequate coordination between branches per EP 4.04 as to checking and design verification prior to the issuance of drawings.
- Drawings were not checked thoroughly to insure correctness and legibility.
   Design and construction were not complete at time of Black and Veatch review.

5/5/83 Task Force Concurrence 24

- 4. Evaluation for Generic Examples
  - A. Preliminary

Problem is generic to hanger drawings and piping isometrics.

B. Finel

Problem is generic to hanger drawings and piping isometrics that have been completed to date.

5/5/83 Task Force Concurrence Who

| 5. Lie    | ensing Sasia Satisfaction                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A.</b> | Preliminary This situation provides as inconvenience to COMST; however, the controls required successfully correlate the hanger location on the physical drawing with the location on the analysis isometric to satisfy the total tolerance prescribed precludes improper hanger installation as a result of these momenclature discrepancies.                                                                                                                            |
| 3.        | Final This situation is only an inconvenience to COMST. Final inspection, WBS 79- place per ECH 3100 will identify visual discrepancies on completed work and will be corrected. Hangers are installed per hanger detail drawings and insp proper location per analysis isometrics. This method prevents improper hang installation even though nomenclature discrepancies exist. Inspection will stringent in future on this as a result of the Black and Vestch review. |
| Resp      | o. ors. 30 Mark 5 /5/83 Task Force Concurrence 2/6-5/7/8                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 6A. Iden  | stification and Evaluation of Ongoing Corrective Action for Completed Work                                                                                                                                                                                                                                                                                                                                                                                                |
| ▲.        | Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| •         | 11/▲                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 3.        | Finel                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Resp      | . Org/ Task Force Concurrence/                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| /A. Iden  | tification of Corrective Action for Completed Work                                                                                                                                                                                                                                                                                                                                                                                                                        |
|           | Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 1         | <b>2/</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| B. 1      | Fine1                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| lesp.     | Org                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| M. Implementation a  | ad Inspection of | f Corrective Ad | stion for Complete | d Work          |
|----------------------|------------------|-----------------|--------------------|-----------------|
| A. Preliminary       |                  |                 |                    |                 |
| M/A                  |                  |                 |                    |                 |
|                      |                  |                 |                    |                 |
| B. Finel             |                  |                 | ٠                  |                 |
|                      |                  |                 | •                  |                 |
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| Resp. Org.           |                  | Task Force      | Concurrence        |                 |
| A. Identification as | d Evaluation of  | Ongoine Corre   | stire Astice des   | Programme Block |
| A. Preliminary       |                  | and and anti-   | ceive meetom for   | racare work     |
| H/A                  |                  |                 |                    |                 |
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| B. Final             | ·                |                 |                    |                 |
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| Resp. Org.           |                  | Task Force      | Concurrence        | , ,             |
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| A. Identification of | Corrective Act   | ion for Future  | Work               | •               |
| A. Preliminary       |                  | •               |                    |                 |
| H/A                  |                  |                 |                    |                 |
|                      |                  |                 |                    |                 |
| B. Final             |                  |                 |                    |                 |
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| 11A. Implementation of         | Corrective Action for Future Work                                                           |                  |
| A. Preliminary                 |                                                                                             |                  |
| E/A                            |                                                                                             | •                |
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|                                |                                                                                             |                  |
| B. Final                       |                                                                                             |                  |
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| Resp. Org.                     |                                                                                             |                  |
| A. Preliminary H/A B. Final    | fectiveness of Corrective Action for Future Work                                            |                  |
| Resp. Org.                     | 1.1                                                                                         | ,                |
|                                |                                                                                             |                  |
| •                              | Evaluation of Ongoing Corrective Action for Comple                                          | sted Work        |
| A. Preliminary                 |                                                                                             |                  |
| The program imp                | plemented by OEDC regarding CEB 81-30 is adequate a                                         | for completed wo |
|                                |                                                                                             |                  |
| B. Final                       |                                                                                             |                  |
| The preliminary implemented by | valkdown inspection, CEB 81-30, and final inspect OEDC are adequate for all completed work. | :iou, WBN 79-14, |
| Resp. Org. 31 10-cd            | 2 5 15 183 Task Force Concurrence                                                           | 517183           |

- 7B. Identification of Corrective Action for Completed Work
  - A. Preliminary

The plan in 68 appears adequate.

3. Final

The plan in 68.8 is adequate.

Resp. Org. Of Most 5/5/83 Task Force Concurrence 2/6-5/7/83

- 8B. Implementation and Inspection of Corrective Action for Completed Work
  - A. Preliminary
  - B. Final
    The preliminary walkdown inspection, CES 81-30 will be completed and tracked by ECH 2576. The final walkdown inspection WBM 79-14 will be implemented after CES 81-30 and ECH 2576 are complete and will be tracked by ECR and ECH to be written when the program is implemented.

Resp. Org. 99 Mark 12 12 11 93 Task Force Concurrence William 12 12 183

- 9B. Identification and Evaluation of Ongoing Corrective Action for Future Work
  - A. Preliminary

The task force could not identify any in place or proposed corrective action.

B. Final

Procedures exist within EN DES to prevent these discrepancies from occurring on any future work.

Resp. Org. JANOS 515123 Task Force Concurrence Will 617183

| ga output                                                                |
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| gn output                                                                |
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| and drafting J. C. Stand P AI-1 R2, what all SWF E to ensure the G/2//83 |
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TVA Task Force for Noview of Black & Vestch Findings

EVALUATION SERET

Nov. 21 Date 4/6/83

- 1. Task Force Category 33 for Matts Ber Muclear Plant Unit 2
- Task Force Category Description and Related Watts Bar Nuclear Plant unit 1 36V Findings:

Inadequate cable tagging: 7807 and 7809

- 3. Evaluation for Cause
  - A. Preliminary
    Watts Ber unit 1: Finding F807 was caused by oversight. The information on the
    tag had the correct cable number and that it was safety-related but the color of
    the tag was incorrect. Finding F809 was caused by repetitious rework which
    resulted in the legibility of the tag to be in question.
    Watts Ber unit 2: This cause does not appear to be applicable to Watts Ber
    unit 2.
  - B. Final

The mineteen cables which were involved in category 13 for unit 2 were checked for tagging. No errors were identified.

Rasp. Org. Ed Buch 4 /18/83 Task Force Concurrence 24/ 4//8/53

- 4. Evaluation for Generic Examples
  - A. Preliminary
    Watta Bar unit 1:
    This is not considered to be generic due to the low frequency and the findings do not present a safety problem.
    Watta Bar unit 2:
    This does not apply to Watta Bar unit 2.
  - B. Pinel

Not generic since no errors were identifed.

Resp. Org. Ed Bush 4/8/83 Task Force Concurrence 2/1/8/83

| 3. L    | icensing Sasis Sat                | tisfaction                                                                                 |                                         |
|---------|-----------------------------------|--------------------------------------------------------------------------------------------|-----------------------------------------|
| Ā       | Proliminary                       | <u>.</u> .                                                                                 |                                         |
|         | Due to the low<br>not sware of as | frequency of the finding at Watts Bar unit<br>my cases on Watts Bar unit 2 the licensing b | l and the task force asis is satisfied. |
| 3,      | Pinel                             |                                                                                            |                                         |
|         | - Concur                          | Rm 4/10/83                                                                                 |                                         |
|         |                                   | 4 18183 Task Force Concurrence 2                                                           |                                         |
|         |                                   | Evaluation of Ongoing Corrective Action for                                                | Completed Work                          |
| 4.      | Preliminary                       |                                                                                            |                                         |
|         | M/A                               |                                                                                            |                                         |
|         |                                   |                                                                                            |                                         |
| 3.      | Finel                             |                                                                                            |                                         |
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| . Ide   | ntification of Co                 | orrective Action for Completed Work                                                        |                                         |
|         | Preliminary                       | •                                                                                          |                                         |
|         | M/A                               |                                                                                            |                                         |
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| ,<br>B. |                                   |                                                                                            |                                         |
| В.      | Final                             |                                                                                            |                                         |
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|              | 8A. Implementation and In   | spection of Correctiv | re Action for Complete | d Work      |
|              | A. Proliminary              |                       |                        |             |
|              | H/A                         |                       |                        |             |
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|              | B. Final                    |                       |                        |             |
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|              | Resp. Org.                  | / Task F              | orce Concurrence       | 1.1         |
|              | 9A. Identification and Ev   | alustion of Ongoing C | orrective Action for 1 | Auture Work |
| display.     | A. Preliminary              | 4                     | •                      |             |
|              | W/A                         |                       |                        |             |
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|              | B. Final                    |                       |                        | ·           |
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|              | Resp. Org.                  | Task Fo               | orce Concurrence       |             |
| 1            | 10A. Identification of Corr | ective Action for Fut | ture Work              |             |
|              | A. Preliminary              |                       |                        |             |
| <del>,</del> | W/A                         |                       |                        |             |
|              |                             | •                     |                        |             |
|              |                             |                       |                        |             |
|              | B. Finel                    |                       |                        |             |
|              | B. Finel                    |                       |                        |             |
|              | 3. Finel                    |                       | ·                      |             |
|              | B. Finel                    | Task Fo               | rce Concurrence        |             |
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| A. Preliminary  N/A  B. Final  Task Force Concurrence //  LA. Verification of Effectiveness of Corrective Action for Future Work  A. Preliminary  N/A  B. Final  Resp. Org. // Task Force Concurrence // | 14. | Implementation of Corrective Action for Puture Work                |   |
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| Basp. Org. // Task Force Concurrence //  LA. Verification of Effectiveness of Corrective Action for Future Work  A. Preliminary  B/A  B. Final                                                           |     | A. Proliminary                                                     |   |
| Rasp. Org. // Task Force Concurrence //  LA. Verification of Effectiveness of Corrective Action for Future Work  A. Preliminary  N/A  B. Final                                                           |     | T/A                                                                |   |
| Rasp. Org. // Task Force Concurrence //  LA. Verification of Effectiveness of Corrective Action for Future Work  A. Preliminary  N/A  B. Final                                                           |     |                                                                    |   |
| Rasp. Org. // Task Force Concurrence //  LA. Verification of Effectiveness of Corrective Action for Future Work  A. Preliminary  N/A  B. Final                                                           |     |                                                                    |   |
| A. Preliminary  H/A  B. Finel                                                                                                                                                                            |     | - Final                                                            |   |
| A. Preliminary  H/A  B. Finel                                                                                                                                                                            |     | · ·                                                                |   |
| A. Preliminary  H/A  B. Finel                                                                                                                                                                            |     |                                                                    |   |
| A. Preliminary  H/A  B. Finel                                                                                                                                                                            |     |                                                                    |   |
| A. Preliminary  ###################################                                                                                                                                                      |     | lesp. Org Task Force Concurrence                                   |   |
| A. Preliminary H/A  B. Finel                                                                                                                                                                             | 24. | Verification of Effectiveness of Corrective Action for Puture Harb |   |
| B. Final                                                                                                                                                                                                 |     |                                                                    |   |
|                                                                                                                                                                                                          |     | N/A                                                                |   |
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| Resp. Org. // Task Force Concurrence //                                                                                                                                                                  | . 1 | . Final                                                            |   |
| Resp. Org / _ Task Force Concurrence / /                                                                                                                                                                 |     |                                                                    |   |
| Resp. Org / _ Task Force Concurrence / _                                                                                                                                                                 |     |                                                                    |   |
| The force observed                                                                                                                                                                                       | 1   | esp. Org. // Task Force Consumption                                |   |
|                                                                                                                                                                                                          |     |                                                                    |   |
| B. Identification and Evaluation of Ongoing Corrective Action for Completed Work                                                                                                                         |     | - Preliminary                                                      |   |
| A. Preliminary                                                                                                                                                                                           |     | M/A                                                                |   |
| A. Preliminary                                                                                                                                                                                           |     | ·                                                                  |   |
| A. Preliminary                                                                                                                                                                                           |     | - Pinel                                                            |   |
| A. Preliminary                                                                                                                                                                                           | •   | , F1041                                                            | • |
| A. Preliminary                                                                                                                                                                                           |     | •                                                                  |   |
| A. Preliminary                                                                                                                                                                                           |     |                                                                    |   |
| A. Preliminary                                                                                                                                                                                           |     |                                                                    |   |

| 73. Identification of | Corrective Action for Completed Work              |        |
|-----------------------|---------------------------------------------------|--------|
| A. Preliminary        |                                                   |        |
| B/A                   |                                                   |        |
|                       |                                                   | e e    |
|                       |                                                   |        |
| 3. Final              |                                                   |        |
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| Resp. Org.            |                                                   |        |
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| B. Implementation and | Inspection of Corrective Action for Completed No. | dk     |
| A. Preliminary        |                                                   |        |
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| B. Finel              |                                                   |        |
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| Resp. Org.            | / / Task Force Concurrence                        |        |
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| . Identification and  | Evaluation of Ongoing Corrective Action for Futur | e Work |
| A. Preliminary        |                                                   |        |
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| B. Final              |                                                   |        |
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| 03. Ideatification of | Corrective Act | ion for Puture | Work          |        |       |
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| B. Implementation of  | Corrective Act | ion for Puture | Work          |        |       |
| A. Preliminary        |                |                |               |        |       |
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TVA Dak Perce for Noview of Black & Vesteb Findings

EVALUATION SHRET

Dete 3/44/83 4/18/83

- 1. Task Porce Category 34 for Matte Bar Muclear Plant Unit 2
- 2. Task Force Category Description and Related Watts Bar Nuclear Plant unit 1 367 Findings: "Out of function" feature of a drawing was not in agreement with the latest design drawing showing the detailed design of the "out of function" feature: 7857, 7910, 7982, 7984, 7985, 7986, 7987, 7988, 7989, 7992, 7993
- 3. Evaluation for Cause
  - A. Preliminary Watts Ber unit 1: "Out of function" features have no effect on the technical adequacy of drawings and are for general location value. Checking of drawings and subsequent revisions of drawings do not include ensuring that all "out of function" features on drawings are in agreement with the latest detailed design for the feature. Watts Bar unit 2: These causes appear to be applicable to Watts Bar unit 2.
  - B. Final

Same as preliminary.

4/24/83 Task Force Concurrence Resp. Org. A. STAALEN

- 4. Evaluation for Generic Examples
  - A. Preliminary

This example is typical of other discrepancies in "out of function" features. No sampling program for Watts Bar unit 2 is necessary because these discrepancies have no potential to affect licensing coumitments.

B. Final

Same as preliminary.

Resp. Org. A. VonAtm 4/26/83 Task Force Concurrence

| A. Prel     | ininery                     |                                                                     |                         |            |             |            |              |
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| 3. Pine     |                             |                                                                     |                         |            |             | -          |              |
| Same        | as prelimin                 | ery.                                                                | •                       |            |             |            |              |
| Bass &      | . A <del></del>             | A.a.                                                                |                         |            |             |            |              |
|             |                             | 4/24/85                                                             |                         |            |             |            | 248          |
|             |                             | valuation of                                                        | Ongoing Con             | Tective Ac | tion for Co | mpleted Wo | rk           |
| A. Prel:    | :Bloary                     |                                                                     |                         |            |             |            |              |
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| . Identific | ation of Cor                | rective Actio                                                       | n for Comp              | leted Work |             |            |              |
| A. Preli    | minery                      |                                                                     |                         |            |             |            |              |
| ¥/A         | ,                           |                                                                     |                         |            |             |            |              |
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| B. Finel    |                             |                                                                     |                         |            | ,           |            |              |
| s. Final    |                             |                                                                     |                         |            |             |            | •            |
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| A. Implementation and Inc | pection of  | Corrective As  | tion for Com | placed Work                             | i    |
| A. Preliminary            |             |                |              |                                         |      |
| T/A                       |             |                | <u> </u>     | ÷ ,, ================================== |      |
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| 3. Final                  |             |                | •            |                                         |      |
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| Resp. Org.                |             | S              | _            |                                         |      |
|                           |             | Task Force     | Concurrence  |                                         |      |
| Identification of Corre   | ctive Actio | a for Future   | iork         |                                         |      |
| A. Preliminar             |             |                |              |                                         |      |
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| B. Final                  |             |                |              |                                         |      |
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| Resp. Org.                | , ,         |                | _            |                                         |      |

| A. Preliminary  H/A  B. Final | rrective Action for Puture Work                |
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| 3. Pinel                      |                                                |
| B. Final                      | •                                              |
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| Resp. Org.                    | / / Task Force Concurrence / /                 |
| A. Verification of Titles     | tiveness of Corrective Action for Future Work  |
| •                             | ctiveness of Corrective Action for Future Hork |
| A. Proliminary                |                                                |
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| B. Final                      |                                                |
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| Resp. Org.                    | / Task Force Concurrence / /                   |

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| 03. Identification | of Corrective Action for Puture Work               |      |
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| Resp. Org.         |                                                    |      |
| 3. Implementation  | of Corrective Action for Future Work               |      |
| A. Preliminary     | ·                                                  |      |
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| Resp. Org.         |                                                    |      |
| B. Verification of | Effectiveness of Corrective Action for Future Work |      |
| A. Preliminary     | or witherive action for Future Work                |      |
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| 3. Identification (                                           |                     |                   | wed.              |        |
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| <ul> <li>Implementation a</li> <li>A. Preliminary</li> </ul>  | ar mabection of Co  | rrective Action ( | for Completed Wor | rk     |
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| <ul> <li>Identification as</li> <li>A. Preliminary</li> </ul> | - sveruerion of Ott | lorna collective  | Action for Futur  | e Work |
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| Resp. Org.                                                    |                     | Task Force Concur | TTERCE            | 1 1    |

d Toronian is some TVA Task Force for Neview of Black & Vestch Findings

EVALUATION SHEET

- 1. Task Force Category 35 for Watts Bar Nuclear Plant Unit 2
- 2. Task Force Category Description and Related Watts Bar Muclear Plant Unit 1 BLV Findings:

Instantaneous trip setting for motor-operated valve breakers is not in accordance with EM DES criteria and vendor recommendations: F137

- 3. Evaluation for Cause
  - A. Preliminary Watte Bar Unit 1 - EN DES critiera and recommendations provided by motor vendors for instantaneous trip setting were not applied correctly for MOV motors rated less than 1/2 hp. - Iradequate checking of the drawing to ensure compliance with established criteria.
  - Watts Bar Unit 2 This applies to Watts Bar Muclear Plant unit 2.
  - B. Final

See Continuation Sheet (page 7).

Resp. Org. Lancamon (1 | 1 | 83 Task Force Concurrence

- 4. Evaluation for Generic Examples
  - A. Preliminary

This finding suggests that this deviation could be applicable to all MOVs with motors rated less than 1/2 hp. Corrective action in step 7A will identify all examples.

B. Finel

Finding is generic to all loads fed from motor control center molded case instantaneous only circuit breakers. Corrective action in step 7A identified all examples.

Resp. Org. Company 1/ 19/83 Task Porce Concurrence 1/1/1/83

### 5. Licensing Basis Satisfaction

A. Preliminary

- (1) The licensing basis is not satisfied because TVA is committed to meeting the requirements of the Mational Electrical Code and has failed to fulfill this commitment for instantaneous trip settings for motors in MOVs rated less than 1/2 hm.
- (2) The safety significance will have to be determined for each deviation identified.

B. Finel

- (1) Same as above.
- (2) No significance to plant safety. Although instantaneous settings were higher than recommended settings, all loads required to perform a safty function would perform acceptably.

Resp. Org. Gaussian N 14/63 Task Force Concurrence 21/1-1/83

# 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

The task force is not sware of any corrective action.

B. Final

No ongoing corrective action for completed work was being done at the time of the finding.

Resp. Org. Gaussing 11 14 1 83 Task Force Concurrence 2 11/2/83

## 7A. Identification of Corrective Action for Completed Work

A. Preliminary

Review all safety-related MOVs with motors rated less than 1/2 hp and evaluate their circuit breakers instantaneous trip settings for compliance with the EN DES critiera established in DS-E9.2.1 and the vendor's recommended setting. Revise any settings as required to be in accordance with EN DES criteria and vendor's recommendation.

B. Final
Review all safety-related MOVs with motors rated less than 1/2 hp was performed and documented by memo from C. C. Fisher to WBP Files dated June 15, 1983 (WBP 830615 022). The necessary corrections were made on ECNs 3904 (UI) and 3905 (U2) which were closed on September 8, 1983 (closure sheet 104 - WPB 830908 068). (See Continuation Sheet - page 7).

Resp. Org. Comesopo N 14/83 Task Force Concurrence 11/1/83

- 8A. Implementation and Inspection of Corrective Action for Completed Work
  - A. Preliminary
  - B. Final

ECRs 3904 (U1) and 3905 (U2) completed and closed on September 8, 1983 - closure sheet 104 (WEP 830908 068).

ECH 4251 - work in progress and will be tracked on ECH through completion.

Resp. Org. Grand of 19 103 Task Force Concurrence 2117/83

- 9A. Identification and Evaluation of Ongoing Corrective Action for Future Work
  - A. Preliminary

The task force is not aware of any corrective action.

B. Finel
All designers and checkers have been been told to strictly adhere to all
criteria used to prepare EN DES drawings, as part of the engineering
procedures training and utilisation program initiated by M. N. Sprouse
Ref: Hemorandum from M. N. Sprouse to Those listed dated February 26, 1982
(MES 820226 255).

Resp. Org. (1907) 1/4/83 Task Force Concurrence

- 10A. Identification of Corrective Action for Future Work
  - A. Preliminary

Provide training to personnel responsible for designing and checking drawings that contain trip settings for MOVs.

B. Final

Mone necessary due to ongoing corrective action specified in 9A.

Resp. Org. Unicopy 11 14183 Task Force Concurrence 21/2/83

| 11A. Implementation A. Preliminer | of Corrective Action                     | for Puture Work                                                          |                       |
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|                                   | from J. C. Standifer                     | ling EP training—Refe<br>ted dated February 26,<br>to Those listed dated | 1000 / *********      |
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|                                   |                                          | rective Action for Fu                                                    | ture Work             |
| A. Preliminary                    | ·                                        |                                                                          |                       |
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| Resp. Org.                        |                                          | Task Force Concurrence                                                   |                       |
| B. Identification                 | and Evaluation of One                    | oing Corrective Action                                                   |                       |
| A. Preliminary                    |                                          |                                                                          | i tor Completed Mork. |
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| B. Final                          |                                          |                                                                          |                       |
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| B. Identification of Con | rrective Act | ion for Completed W | ork               |          |
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| A. Preliminary           |              |                     |                   |          |
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| B. Final                 |              |                     |                   |          |
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| . Implementation and a   |              |                     |                   |          |
| . Implementation and In  | spection of  | Corrective Action f | or Completed Work | <b>,</b> |
| A. Preliminary           |              |                     |                   |          |
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| B. Final                 |              |                     |                   | •        |
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| 03. Identification of  | Corrective Action for Puture Work             | ··  |
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| A. Preliminary         |                                               |     |
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| 3. Implementation of ( | Corrective Action for Puture Work             |     |
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| B. Final               |                                               |     |
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| A. Verification of Rec |                                               |     |
| A. Preliminary         | ectiveness of Corrective Action for Future Wo | rk  |
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| Resp. Ore.             |                                               |     |

-6-

TVA Task Force for Review of Black & Veatch Findings

#### BLACK & VEATCE EVALUATION SHEET (Continuation Sheet)

#### 3.B. Final

Division of Engineering Design Electrical Standard 30A301 (issued 10-2-51) which was in effect at the time of Watts Bar initial circuit design, provided no criteria for molded case circuit breaker instantaneous trip settings. Instead, manufacturer's criteria provided as part of the motor control center contract, was used to determine correct settings. On September 28, 1976, TVA Standard 30A301 was superseded by EM DES Standard DB-E9.2.1. This standard specified (for the first time) that Mational Electrical Code criteria would be used to set instantaneous only breakers. EM DES failed to fully retrofit this new criteria into its original design for the following reasons:

- (1) An assumption on the part of the designer and checker attempting to implement this requirement, resulted in setting the majority of breakers one setting too high. This occurred because the designer calculated 13 times the full load current (FLI) and then set the breaker to the next higher setting to prevent nuisance tripping. In actuality, he should have set it on setting lower for strict compliance with the NEC.
- (2) In some cases the existing breaker would have had to be replaced to adhere strictly to the NEC criteria. The designer judged that the lowest setting for the existing breaker, while slightly higher than 13 time FLI, was still adequate. In actuality the breakers should have been replaced for strict compliance with the NEC.

### 7A. B. Final (continued from page 2)

Additionally, all remaining safety-related loads fed from motor control center instantaneous only breakers were reviewed per request from EEB dated September 8, 1983 (EEB 830908 926). This review determined that 13 breakers required replacement and 385 breakers required resetting. ECN 4251 has been issued to make these corrections. The ECN package includes documentation of the study.

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SELECT

Nov. 81 Date 11/9/83

- 1. Task Force Category 36 for Watts Bar Nuclear Plant Unit 2
- 2. Task Force Category Description and Related Watts Bar Muclear Plant Unit 1 34V Findings: The cable tray fill criteria (FSAR section 8.3.1.4.5) is not assured of being met because of the less than conservative nominal values used for cable cross sectional areas in the cable routing program F135
- 3. Evaluation for Cause
  - A. Preliminary
    Personnel involved did not identify that this potential deviation from the FSAR
    commitment would result in a condition adverse to quality. After the evaluation
    in Step 5, the cause(s) will have to be determined if the licensing basis is not
    satisfied.
  - B. Final

Refer to 5 A. B., Licensing Basis Satisfaction

Resp. Org. R.L. Swellows 11/10/93 Task Force Concurrence

- 4. Evaluation for Generic Examples
  - A. Preliminary After completion of Step 5, this will be evaluated for generic examples if the licensing basis is not satisfied.
  - B. Final

N/A

Resp. Org. A.L. Swellane III 10/ 93 Task Porce Concurrence



- A. Preliminary
  Licensing basis satisfaction needs to be investigated in the following areas: 1)
  FSAR requirements satisfied; 2) Effect on ampacity if overfill occurs in a power
  tray; 3) The tray dynamic response and tray support loading if tray overfill
  occurs; 4) Fire protection requirements if originally specified for 60% fill.
- B. Final

See Continuation Sheet (page 7)

Resp. Org. R.L. SureMente 11/10/83 Task Porce Concurrence 2/1/14/83

- 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work
  - A. Preliminary
    The task force is not aware of any corrective action.
  - B. Final

N/A

Resp. Org. R.L. Swallows III 10/83 Task Force Concurrence 25/6- 11 1/4/8

- 7A. Identification of Corrective Action for Completed Work
  - A. Preliminary To be determined if evaluation in Step 5 shows the licensing basis is not satisfied.
  - B. Final

N/A

Resp. Org. Rt. Surall no. 11/10/95 Task Force Concurrence 26 11/4/83

| 84.          | . I= | plementation and Inspection of Corrective Action for Completed Work                              |
|--------------|------|--------------------------------------------------------------------------------------------------|
|              | A.   | Preliminary                                                                                      |
|              |      | N/A                                                                                              |
|              | в.   | Final                                                                                            |
|              |      | N/A                                                                                              |
|              | Res  | op. Org. Raswellow 11/10/93 Task Force Concurrence Office 11/1483                                |
| 9 <b>A</b> . | Ide  | mtification and Evaluation of Ongoing Corrective Action for Future Work                          |
|              | A.   | Preliminary The task force is not aware of any corrective action.                                |
|              |      |                                                                                                  |
|              | В.   | Final                                                                                            |
|              |      | N/A                                                                                              |
|              | Res  | p. Org. R.L Swellows 14/0/83 Task Force Concurrence 21/1/483                                     |
| A.           | Ide  | ntification of Corrective Action for Future Work                                                 |
| •            | A.   | Preliminary  To be determined if evaluation in step 5 shows the licensing basis is not satisfied |
|              |      |                                                                                                  |
| 1            | В.   | Final                                                                                            |
|              |      | N/A                                                                                              |
|              |      |                                                                                                  |
|              |      |                                                                                                  |

Resp. Org. R. 6. San Direct 11/10/83 Task Force Concurrence

| B. Final  N/A  Resp. Org. Respectiveness of Corrective Action for Future Work  A. Preliminary  B. Final  Resp. Org. // Task Force Concurrence //  Identification and Evaluation of Ongoing Corrective Action for Completed Work  A. Preliminary                                                                  |      | Implementation of Corrective Action for Puture Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Resp. Org. R.6. Surellena 11/10/93 Task Force Concurrence Action for Future Work  A. Preliminary  B. Final  Resp. Org/ Task Force Concurrence/  Identification and Evaluation of Ongoing Corrective Action for Completed Work  A. Preliminary  A. Preliminary  B/A                                               |      | A. Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Resp. Org. R.6. Surellena 11/10/93 Task Force Concurrence Action for Future Work  A. Preliminary  B. Final  Resp. Org/ Task Force Concurrence/  Identification and Evaluation of Ongoing Corrective Action for Completed Work  A. Preliminary  A. Preliminary  B/A                                               |      | $\cdot$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Resp. Org. R.6. Surellena 11/10/93 Task Force Concurrence Action for Future Work  A. Preliminary  B. Final  Resp. Org/ Task Force Concurrence/  Identification and Evaluation of Ongoing Corrective Action for Completed Work  A. Preliminary  A. Preliminary  B/A                                               |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Resp. Org. R.6. Surellena 11/10/93 Task Force Concurrence Action for Future Work  A. Preliminary  B. Final  Resp. Org/ Task Force Concurrence/  Identification and Evaluation of Ongoing Corrective Action for Completed Work  A. Preliminary  A. Preliminary  B/A                                               |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Resp. Org. R.6. Swellers 11/10/23 Task Force Concurrence 2011/1/25  A. Verification of Effectiveness of Corrective Action for Future Work  A. Preliminary  B. Final  Resp. Org. // Task Force Concurrence //  Identification and Evaluation of Ongoing Corrective Action for Completed Work  A. Preliminary  B/A |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| A. Preliminary  B. Final  Resp. Org/ Task Force Concurrence/  Identification and Evaluation of Ongoing Corrective Action for Completed Work  A. Preliminary  H/A                                                                                                                                                 |      | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| A. Preliminary  B. Final  Resp. Org/ Task Force Concurrence/  Identification and Evaluation of Ongoing Corrective Action for Completed Work  A. Preliminary  H/A                                                                                                                                                 |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| A. Preliminary  B. Final  Resp. Org/ Task Force Concurrence/  Identification and Evaluation of Ongoing Corrective Action for Completed Work  A. Preliminary  H/A                                                                                                                                                 |      | Pears One Or Of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the C |
| B. Final  Resp. Org. // Task Force Concurrence //  Identification and Evaluation of Ongoing Corrective Action for Completed Work  A. Preliminary  H/A                                                                                                                                                            |      | Task Force Concurrence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| B. Final  Resp. Org. // Task Force Concurrence //  Identification and Evaluation of Ongoing Corrective Action for Completed Work  A. Preliminary  H/A                                                                                                                                                            | 24.  | Perification of Effectiveness of Corrective Action for Future Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Resp. Org. // Task Force Concurrence // Identification and Evaluation of Ongoing Corrective Action for Completed Work A. Preliminary H/A                                                                                                                                                                         |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| Resp. Org. // Task Force Concurrence // Identification and Evaluation of Ongoing Corrective Action for Completed Work A. Preliminary H/A                                                                                                                                                                         | 1    | e Final                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| . Identification and Evaluation of Ongoing Corrective Action for Completed Work A. Preliminary E/A                                                                                                                                                                                                               |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| . Identification and Evaluation of Ongoing Corrective Action for Completed Work A. Preliminary E/A                                                                                                                                                                                                               |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| . Identification and Evaluation of Ongoing Corrective Action for Completed Work A. Preliminary E/A                                                                                                                                                                                                               |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| A. Preliminary H/A                                                                                                                                                                                                                                                                                               | B    | esp. Org. // Task Force Concurrence //                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| A. Preliminary H/A                                                                                                                                                                                                                                                                                               | B. I | dentification and Evaluation of Ongoing Corrective Action for Contactive                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                                                                                                                                                                                                                                                  | A    | - Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| •                                                                                                                                                                                                                                                                                                                |      | H/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| B. Fine!                                                                                                                                                                                                                                                                                                         |      | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                                                                                                                                  | В.   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                  | В.   | Finel                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                                                                                                                                                                                                                  | В.   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Resp. Org. // Task Force Concurrence //                                                                                                                                                                                                                                                                          |      | Final                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

| 73. | Identification of Corrective Action for Completed Work                |      |
|-----|-----------------------------------------------------------------------|------|
|     | A. Preliminary N/A                                                    |      |
|     | B. Finel                                                              |      |
|     | Resp. Org. // Task Force Concurrence                                  | / /  |
| B.  | Implementation and Inspection of Corrective Action for Completed Work |      |
|     | A. Preliminary N/A                                                    |      |
|     | B. Finel                                                              |      |
|     | Resp. Org. // Task Force Concurrence                                  |      |
| В.  | Identification and Evaluation of Ongoing Corrective Action for Future | Work |
|     | A. Preliminary N/A                                                    |      |
|     | B. Final                                                              |      |
|     |                                                                       | ·    |
|     | Resp. Org. // Task Force Concurrence                                  |      |

| 108. | Identification of Corrective Action for Future Work                |
|------|--------------------------------------------------------------------|
|      | A. Preliminary N/A                                                 |
|      | 3. Final                                                           |
|      | Resp. Org. // Task Force Concurrence //                            |
| 113. | Implementation of Corrective Action for Future Work                |
|      | A. Preliminary N/A                                                 |
|      | B. Finel                                                           |
|      | Resp. Org. / / Task Force Concurrence / /                          |
| 2B.  | Verification of Effectiveness of Corrective Action for Future Work |
|      | A. Preliminary N/A                                                 |
|      | B. Final                                                           |
|      |                                                                    |

TVA Task Force for Review of Black & Veatch Findings

#### SLACK & VEATCH EVALUATION SHEET (Continuation Sheet)

- 5. Licensing Basis Satisfaction
  - B. Final
  - 1. The FSAR requirements have been satisfied as discussed below.
  - 2. This Black & Veatch finding erroneously identified cables as being installed in power (V4 level) cable trays; whereas, the cables identified are installed in control (V3 level) cable trays. The criteria for tray fill of V4 power trays is 30 percent of the available cross-sectional area of the tray; the tray fill for V3 control and instrumentation (V2 and V1) trays is 60 percent. The cable fill is based on summing the areas of the various cables that are randomly laid in the trays. Any minute variance in nominal cable diameter of power cables has no significance on cable area or tray fill; thus, there is no effect on ampacities of cables installed in power trays.

TVA procures insulated cables at different times for a project. The same type of cable, by identification mark number, meets the same specification even though different vendors may supply the cable. The cables are manufactured following the guidelines of the Insulated Cable Engineers Association (ICEA) standards which allow tolerances for insulation and jacket thickness. Therefore, cable diameters from the same or different vendors generally do vary slightly. Although TVA did not specify a maximum outside diameter (OD) for the WBM cables, vendors normally stay within ICEA tolerences of approximately 5 percent, obviously for competetive reasons. Variations in cable OD of multiconductor cables are usually attributed to light-weight filler material.

For example, a 2-conductor No. 14 AWG control cable may be manufactured by the flat (two insulated conductors run parallel to each other with an overall jacket—oval shape) method, or by the round (two insulated conductors that are twisted with filler material under the overall jacket—round shape) method. This type cable is used for control functions that convey information or intermittantly operate devices controlling power switching or conversion equipment. Thus, conductor heating is insignificant for control cables, as well as instrumentation cables, and raceway fill does not affect cable ampacity.

For WBN, the majority (approximately 85 to 90 percent) of the two-conductor control cable furnished was constructed by the flat method. This oval-shaped 2-conductor cable was equated to have a nominal 0D of .309 inches used for tray fill calculations. Some of the round-shaped two conductor cable has an 0D of .404 inches. These two cables have the greatest disparity in 0D and thus cross-sectional area as noted in the

TVA Task Force for Review of Black & Veatch Findings

BLACK & VEATCH EVALUATION SHEET (Continuation Sheet)

### 5. Licensing Basis Satisfaction (continued)

#### B. Final

Black & Veatch finding; again this difference is due primarily to the added light-weight filler material of the round cable. However, the average cable routed in control level trays is 5-conductor. Therefore, for a given control level tray, multi-conductor control cables may vary from a 2-conductor through a 19-conductor configuration.

Although TVA used nominal OD in calculating the cross-sectional area of the cable for tray loading purposes, the nominal OD may vary only a few thousandths of an inch compared to a respective cable vendor data. Even if these variances do result in a cross-sectional loading slightly above 60 percent fill for control and instrumentation cable trays, there is no effect on cable ampacity. For power cables, the copper cross-sectional area is not increased by any increase of cross-sectional area of the finished cable assembly, due to increased insulation/jacket thicknesses. The adequacy of the current carrying capability and ampacity derating of power cables, when routed in trays, is considered by the cable designer when he sizes the cable for its application, including short circuit handling capability. For example, power cables for motor circuits are conservatively sized for 125 percent of motor ratings. Thus, adequate cable ampacity exists for power cables in trays which have a 30-percent fill by cross-sectional area.

- 3. Any minute differences in nominal cable ODs versus actual ODs have no impact on either the cable tray support system or the fire hazards analysis. The dead weight loading of cables, cable trays and fittings, is applicable cable costing used a conservative composite weight of 45 lbs/ft of tray (for 18-inch width) in the dreelopment of criteria for the cable tray support system. The composite weight and combustible loading are based on trays being 100 percent fill.
- 4. For the type of cables used, the insulations and jackets have a range of combustibles from 6000 to 14,000 BTUs/lb. The fire hazards analysis utilized a conservative 14,000 BTUs/lb fire loading of combustible cable material where cable trays occur. Moreover, the applied cable coating reduces the ignitibility and combustibility of the insulation/jacket material. In addition, were more than 120,000 BTUs/sq ft of installed combustibles exist in safety-related areas, a fixed suppression system is installed.

From this evaluation, minor variations in actual cable tray fill have no effect on cable ampacities, on the support system, or on the fire protection system. Therefore, TVA's position is that the installation is satisfactory and complies with FSAR requirements.

TVA Task Force for Raview of Black & Westch Findings

EVALUATION SHEET

1. Task Force Category 37 for Watts Bar Nuclear Plant - Unit 2

2. Task Force Category Description and Related Watts Bar Nuclear Plant Unit 1 86V Findings: Valve wiring circuits are designed such that the red and green indicating lights on the unit control board will light dimly upon malfunction of the P-auto contact of the Westinghouse W-2 control switch on the unit control board: F112

### 3. Evaluation for Cause

A. Preliminary

Watts Bar Unit 1 - Inadequate recognition of need to design circuits that do not rely on a situation where the operator must make a judgement of lamp brightness to determine equipment condition.

-Inadequate design checking/verification during circuit design process to allow "sneak circuit" condition to exist. Watts Bar unit 2 - These causes appears to be applicable to Watts Bar unit 2.

B. Final

The need to design circuits that do not rely on operator judgment of lamp brightness to determine equipment status was recognized and design proceeded accordingly. However, the identified failure was the result of a single random design error in conjunction with inadequate design checking/verification during

Resp. Org. MRBJun 2/29/84 Task Force Concurrence 2/2 2 29/84

4. Evaluation for Generic Examples

A. Preliminary Problem is generic to valve wiring circuits containing Westinghouse W-2 switches throughout WBN unit 2.

B. Final

Concur.

Resp. Org. MRBeler 2/27/84 Task Force Concurrence

|     | _         |                                                                                                                               |                                                           |
|-----|-----------|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| 5.  |           | censing Basis Satisfaction                                                                                                    |                                                           |
|     | <b>A.</b> | Preliminary                                                                                                                   | ntified in FSAR Section 7. Satisfied for al               |
|     | В.        | Final                                                                                                                         |                                                           |
|     |           | Licensing basis was not satisfied fo this condition.                                                                          | safety systems. ECN 4592 will correct                     |
|     | Res       | p. Org. MRBelu Z /27/84 Task                                                                                                  | Force Concurrence                                         |
| 6▲. | Ide:      | ntification and Evaluation of Ongoing Preliminary Task force is not aware of any action                                       |                                                           |
| ;   | В.        | Final Concur.                                                                                                                 |                                                           |
|     | le s p    | o. Org. MRB. 2/29/84 Task                                                                                                     | Force Concurrence                                         |
|     | ۱.        | trification of Corrective Action for C<br>Preliminary<br>All safety system valve circuits need<br>identified "sneak circuit." | mpleted Work  to be reviewed and revised to eliminate the |
| В   | • :       | Final                                                                                                                         |                                                           |

All safety system valve circuits have been reviewed to determine which circuits contain the identified "sneak circuits." The design for these is being revised.

Resp. Org. 90 R B. elu- 2 /27/84 Task Force Concurrence 2/27/84

- 8A. Implementation and Inspection of Corrective Action for Completed Work
  - A. Preliminary
  - B. Final

Implementation and inspection of corrective action for completed work will be will be accomplished prior to unit 2 fuel load by ECN 4592.

Resp. Org. 90 R Rehum 2/29/84 Task Force Concurrence 2/27/84

- 9A. Identification and Evaluation of Ongoing Corrective Action for Future Work
  - A. Preliminary
    Task force knows of no ongoing programmatic corrective action.
  - B. Final

Concur.

Resp. Org. MABelo Z /29/8 y Task Force Concurrence Z

- 10A. Identification of Corrective Action for Future Work
  - A. Preliminary
    Must be determined by evaluation of cause(s).
  - B. Final

The identified failure was the result of a single random design error. All designers are aware of the potential for this type of error, particularly during design of circuit modifications, and strive to avoid these errors. No corrective action for future work will be required.

Resp. Org. MRBelow 2/29/84 Task Force Concurrence 26 2 2 184

| IIA. | Implementation of Corrective Action for Future Work                         |        |
|------|-----------------------------------------------------------------------------|--------|
|      | A. Preliminary                                                              |        |
|      | n/a                                                                         |        |
|      |                                                                             |        |
|      |                                                                             |        |
|      | B. Final                                                                    |        |
|      | N/A                                                                         |        |
|      |                                                                             |        |
|      |                                                                             |        |
|      | Resp. Org. M R B. Lux 1/29/84 Task Force Concurrence                        | _/27/8 |
| 12A. | Verification of Effectiveness of Corrective Action for Future Work          |        |
|      | A. Preliminary                                                              |        |
|      |                                                                             |        |
|      |                                                                             |        |
|      | B. Final                                                                    |        |
|      |                                                                             |        |
|      |                                                                             |        |
|      | 2/21/84                                                                     |        |
|      | Resp. Org. 70 RR. 2/29/8-7 Task Force Concurrence                           | 1 1.   |
| 6B.  | Identification and Evaluation of Ongoing Corrective Action for Completed Wo |        |
|      | A. Preliminary                                                              | ork    |
|      | N/A                                                                         |        |
|      |                                                                             |        |
|      |                                                                             |        |
| 1    | B. Final                                                                    |        |
|      |                                                                             |        |
|      |                                                                             |        |
|      | Page And                                                                    |        |
|      | Resp. Org. / / Task Force Concurrence                                       | / /    |

| /B. Identification of Cor  | rrective Action for Completed Work |                    |
|----------------------------|------------------------------------|--------------------|
| A. Preliminary             |                                    |                    |
| N/A                        |                                    |                    |
|                            |                                    |                    |
| B. Final                   |                                    |                    |
| o. ruel                    |                                    |                    |
|                            |                                    |                    |
|                            |                                    |                    |
| Resp. Org.                 | Task Force Concurre                | nce/_/             |
| 3B. Implementation and Inc | spection of Corrective Action for  | Completed Work     |
| A. Preliminary             |                                    | Completed MOLK     |
| N/A                        |                                    |                    |
|                            |                                    |                    |
| <b>.</b>                   |                                    |                    |
| B. Final                   |                                    |                    |
|                            |                                    |                    |
|                            |                                    |                    |
| Resp. Org.                 | / / Task Force Concurren           | ice/_/             |
| B. Identification and Eva  | lustion of Ongoing Corrective Acti |                    |
| A. Preliminary             | ongoing dollective wet             | on for future Work |
| N/A                        |                                    |                    |
|                            |                                    |                    |
| B. Final                   |                                    |                    |
| thei                       |                                    |                    |
|                            |                                    |                    |
|                            |                                    |                    |
|                            |                                    |                    |

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| 1                                                           |            |
|-------------------------------------------------------------|------------|
| OB. Identification of Corrective Action for Future Work     |            |
| A. Preliminary                                              |            |
| N/A                                                         |            |
|                                                             |            |
| B. Final                                                    | •          |
|                                                             |            |
|                                                             |            |
| Resp. Org. // Task Force Concurre                           | nce/_/     |
| 13. Implementation of Corrective Action for Future Work     |            |
| A. Preliminary                                              |            |
| N/A                                                         |            |
|                                                             |            |
| B. Final                                                    |            |
|                                                             |            |
|                                                             |            |
|                                                             |            |
| Resp. Org. // Task Force Concurren                          |            |
| B. Verification of Effectiveness of Corrective Action for F | uture Wark |
| A. Preliminary                                              |            |
| N/A                                                         |            |
|                                                             |            |
| B. Final                                                    |            |
|                                                             |            |
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| Resp. Org. // Task Force Concurrence                        | ce/ /      |
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|                                                             |            |

EVALUATION SHEET

Rev. <u>\$2</u> Date 12/19/83

1. Task Force Category 18 for Watts Bar Suclear Plant - Unit 2

2. Task Force Category Description and Related Watts Bar Huclear Plant unit 1 B&V Findings: Evaluation to determine if design of thermal overload bypass circuits met requirements of commitments to RG 1.106 and IEEE 279-1971: F108 and F122.

## 3. Evaluation for Cause

A. Preliminary

Watts Bar Unit 1: After the evaluation in Step 5, the cause(s) will have to be determined if the licensing basis is not satisfied.
Watts Bar Unit 2: The same evaluation must be accomplished for Watts Bar unit 2.

B. Final

Licensing basis is satisfied. See Item 5 for justification.

Resp. Org. On Silver 185 Task Force Concurrence 2/13/84

# 4. Evaluation for Generic Examples

A. Preliminary

After completion of Step 5, this will be evaluated for generic examples if the licensing basis is not satisfied.

B. Final

The condition is generic for Watts Bar Units 1 and 2 motor-operated valves.

Resp. Org. DI /21 /21 /23 Task Force Concurrence 2 1 1 184



- A. Preliminary
  WBH MOV thermal overload bypase design needs to be investigated for: (1)
  Capability for "... testing and calibrating channels, and the device used to
  drive the final system output signal from the various channel signals,..." as
  required by IEEE 279-1971 (Section 4.10), and (2) Reasons for the BLM thermal
  overload bypass circuit design philosophy differing from that used at BFM, SQM,
  and WBH.
- B. Final

See continuation sheet for justification.

Resp. Org. M. Sale 12/21/83 Task Force Concurrence Aller 1/3/84

- 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work
  - A. Preliminary

Task force is not aware of any corrective action.

B. Final

No corrective action required.

Resp. Org. DM. College /24 /83 Task Force Concurrence 113 184

- 7A. Identification of Corrective Action for Completed Work
  - A. Preliminary

To be determined after evaluation in Step 5 is complete.

B. Final
No corrective action has been identified. However, WB-DCR-482 will be implemented for operating convenience. This modification will add one relay to each of the eight motor control centers and change wiring so that an indicator light will come on when all overload bypass relays for a given motor control center operate. The modified test circuit will also fully satisfy the requirements of RG.1.106, G.1.b, and IEEE 279, 4.10
Resp. Org. Task Force Concurrence

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

M/A

B. Final

N/A

Resp. Org. In Col. 12/21/83 Task Force Concurrence 21/6 / 13/84

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

Task force knows of no ongoing programmatic corrective action.

B. Final

The modified test circuit will be included with any motor operated valve overload relay bypass circuits added at Watts Bar Nuclear Plant in the future.

Resp. Org. M. Jaky 12/51/83 Task Force Concurrence

10A. Identification of Corrective Action for Future Work

A. Preliminary

To be determined if evaluation in Step 5 shows the licensing basis is not satisfied.

B. Final

M/A

Resp. Org. Don Complete 183 Task Force Concurrence 113/84

11A. Implementation of Corrective Action for Future Work A. Preliminary No corrective action required. B. Final No corrective action required. Resp. Org. M. C.10 (2./21/83 Task Force Concurrence 2/13/84 12A. Verification of Effectiveness of Corrective Action for Future Work A. Preliminary No corrective action required. B. Final Resp. Org. Don Sale 12 /24 /83 Task Force Concurrence 6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work A. Preliminary N/A B. Final Resp. Org. On Culture 1/83 Task Force Concurrence

| Identification of Corrective Action for Completed Work                    |
|---------------------------------------------------------------------------|
| A. Preliminary                                                            |
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|                                                                           |
| B. Finel                                                                  |
| ·                                                                         |
|                                                                           |
| Resp. Org. On Supplied 12/21/83 Task Force Concurrence                    |
| Implementation and Inspection of Corrective Action for Completed Work     |
| A. Preliminary                                                            |
| N/A                                                                       |
|                                                                           |
| B. Final                                                                  |
|                                                                           |
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| Resp. Org. D.M. S.M. R/21/R3 Task Force Concurrence                       |
| dentification and Evaluation of Ongoing Corrective Action for F-ture Work |
| . Preliminary                                                             |
| H/A                                                                       |
|                                                                           |
| . Final                                                                   |
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| esp. Org. J. S. J. 12/21/83 Task Force Concurrence                        |
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| 103. | Identification of Corrective Action for Future Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | A. Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|      | <b>11/</b> ▲                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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|      | B. Final                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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|      | 2-1 8:10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|      | Resp. Org. 201 Supply 12 /21 /83 Task Force Concurrence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 13.  | Implementation of Corrective Action for Future Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|      | A. Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|      | H/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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|      | B. Final                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| 28.  | Verification of Effectiveness of Corrective Action for Future Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 4    | A. Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|      | H/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| I    | 3. Final                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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|      | tesp. Org. Org. 12/21/83 Task Force Concurrence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

#### SLACE & VEATCE EVALUATION SHEET (Continuation Sheet)

- 5. Licensing Basis Satisfaction
  - B. Final
- (1) MG 1.106 (Thermal Overload Protection for Electric Motors on Motor-Operated Valves), identifies the criterion for thermal overload protection devices that are integral with the motor starter for electric motors on motor-operated valves. IC 1.106 also describes three methods that are acceptable to the Muclear Regulatory Commission staff for complying with the identified criterion. The method described in Position C.1.b requires that those thermal overload protection devices that are normally in force during plant operation should be bypassed under accident conditions. This position has been implemented at Watts Bar and Bellefonte Muclear Plants. Regulatory Position C.1 also requires that the bypass system circuitry conform to certain sections of IEEE 279. IEEE 279 Section 4.10 requires that devices used to derive the final system output signal be tested. These devices are the relays that actually perform the overload bypass. At Watts Bar Buclear Plant, the testing of these devices is accomplished by pushing a test button at each motor control center, and observing that the relay for each individual valve operates. The relay operation is verified by checking to see if the relay indicator window, located on the side of the relay, changed state. The Regulatory Position also requires that the bypass system circuitry conform to Section 4.13 of IEEE 279. IEEE 279 Section 4.13 requires that a continuous indication of bypass be in the main control room if the protective action or some part of the system has been bypassed or deliberately rendered inoperative for any purpose. This section does not apply since no part of the protective action is bypassed during the test. Indication is provided in the main control room that the overload bypass signal has been initiated. The method of testing described above is acceptable for this application because it verifies relay operation by observation of a positive action. The licensing basis is satisfied in that the thermal overload bypass can be tested using one operator to initiate the test and a second operator some distance away to verify mechanical operation of the relay.
- (2) A test circuit modification to improve operating flexibility and convenience has been approved by EH DES. See design change request WB-DCR-482 (DES 830701 009); M. M. Sprouse to H. S. Green, September 21, 1983 (WBF 830921 056); and H. J. Green to M. M. Sprouse, Hovember 30, 1983 (DES 831201 012). When implemented, it will be possible for the operator initiating the test to determine that all bypass relays for a motor control center have operated by observing one test light.
- (3) At Bellefonte Suclear Plant, the testing of the overload bypass is accomplished by pushing a test button at each motor control center, and observing that an indicator light came on. This indicator light is wired up such that each overload bypass relay would have to operate before the light would come on. This also satisifies Regulatory Position identified in EC 1.106 and IEEE 279 Section 4.10. IEEE 279 Section 4.13 does not apply for the same reason given in 5.8(1). EC 1.106 came into effect at different construction phases of TVA's various nuclear plants. It is not a requirement that all TVA's nuclear plants be identical. In fact, different design organizations are performing the detail design for each plant and such things as expense and equipment availability are weighed heavier than making all plants identical.

EVALUATION SHEET

Rev.  $\frac{R2}{3/1/84}$ 

1. Task Force Category 39 for Watts Bar Muclear Plant - Unit 2

2. Task Force Category Description and Related Watts Bar Huclear Plant Unit 1 B&V Findings: The specific configuration of 6.9-kV bundled cables in trays has not been tested for the effects of fire retardant coating on the ampacity of the cable: G901

# 3. Evaluation for Cause

A. Preliminary

TVA considered the tests performed to determine fire retardant coatings' effect on ampacity of cables to adequately justify not derating cables due to fire retardant coatings. Determination of cause(s) will be done if evaluation in step 5 shows licensing basis is not satisfied.

B. Final

Refer to 5.A.B, Licensing Basis Satisfaction.

Resp. Org. R.L. Surallows 11/10/83 Task Force Concurrence

4. Evaluation for Generic Examples

A. Preliminary

This finding indicates that other similar examples exist.

B. Final

N/A

Resp. Org. Q. t. Sandles 11/10/83 Task Force Concurrence 24/1/983



A. Preliminary

Licensing basis satisfaction needs to be determined by evaluating the effects of the fire retardant coating on the ampacity of the 6.9-kV cables when the cables bundled together in trays.

B. Final

See Continuation Sheet (page 7).

Resp. Org. Rt. Surallone /1/10/83 Task Force Concurrence

28/ 3/2/84 00 28/ 11 V483

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

Task force is not aware of any corrective action.

B. Final

N/A

Resp. Org. L.L. Swallow 14/0/83 Task Force Concurrence 24/11/4 53

7A. Identification of Corrective Action for Completed Work

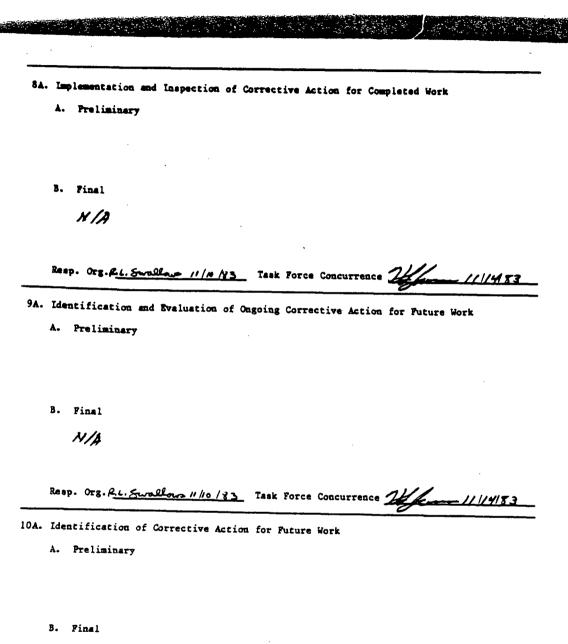
A. Preliminary

If evaluation in step 5 shows the licensing basis is not satisfied, corrective action will be determined.

B. Final

N/A

Resp. Org. R.L. Swallows 11/10/93 Task Force Concurrence



Resp. Org. 81-Sura Mars 11/10/83 Task Force Concurrence 24/183

N/A

|           | Implementation of Corrective Action for Future Work                                                |
|-----------|----------------------------------------------------------------------------------------------------|
|           | A. Preliminary                                                                                     |
|           | B. Final .                                                                                         |
|           | N/A  Resp. 077.61.5. 08.7.4/10/93. Took Pages 6                                                    |
|           | Resp. Org. R.L. Swellow 11 /10 /43 Task Force Concurrence 11 /11/183                               |
| 12A.      | Verification of Effectiveness of Corrective Action for Future Work  A. Preliminary                 |
|           | B. Final                                                                                           |
|           | •                                                                                                  |
|           | Resp. Org. // Teak Page Cameurana                                                                  |
|           | Resp. Org. // Task Force Concurrence //                                                            |
| <br>6B.   | Identification and Evaluation of Ongoing Corrective Action for Completed Work                      |
| - <u></u> |                                                                                                    |
| 6B.       | Identification and Evaluation of Ongoing Corrective Action for Completed Work  A. Preliminary      |
| 6B.       | Identification and Evaluation of Ongoing Corrective Action for Completed Work  A. Preliminary      |
| 6B.       | Identification and Evaluation of Ongoing Corrective Action for Completed Work  A. Preliminary  N/A |

| 78. Identification of Corrective Action   | for Completed Work           |             |
|-------------------------------------------|------------------------------|-------------|
| A. Preliminary                            |                              |             |
| W/A                                       | •                            |             |
|                                           |                              |             |
| B. Final                                  |                              |             |
|                                           |                              |             |
|                                           |                              |             |
| Resp. Org. //                             | Task Force Concurrence       |             |
| BB. Implementation and Inspection of Cor- | rective Action for Completes | d Work      |
| A. Preliminary                            |                              |             |
| H/A                                       |                              |             |
|                                           |                              |             |
| B. Finel                                  |                              |             |
| •                                         |                              |             |
|                                           |                              |             |
| Resp. Org. / /                            | Task Force Concurrence       | 1 1         |
| B. Identification and Evaluation of Ongo  | oing Corrective Action for I | luture Work |
| A. Preliminary                            |                              |             |
| N/A                                       |                              |             |
|                                           |                              |             |
| B. Final                                  |                              |             |
|                                           |                              |             |
|                                           |                              |             |
| Resp. Org. / / 1                          | Task Porce Concurrence       |             |

| 103. Identification of Corrective Action for Future Work                                                      |     |
|---------------------------------------------------------------------------------------------------------------|-----|
| A. Preliminary                                                                                                |     |
| N/A                                                                                                           |     |
|                                                                                                               |     |
| B. Final                                                                                                      |     |
| Resp. Org. // Task Force Concurrence                                                                          | /_/ |
| IB. Implementation of Corrective Action for Future Work                                                       |     |
| A. Preliminary                                                                                                |     |
| N/A                                                                                                           |     |
|                                                                                                               |     |
| B. Final                                                                                                      |     |
| Resp. Org. // Task Force Concurrence                                                                          |     |
| 2B. Verification of Effectiveness of Corrective Action for Future Work                                        |     |
| A. Preliminary                                                                                                |     |
| N/A                                                                                                           |     |
| B. Finel                                                                                                      |     |
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| Resp. Org. // Task Force Concurrence                                                                          |     |

## BLACK & VEATCH EVALUATION SHEET (Continuation Sheet)

# 5. Licensing Basis Satisfaction

#### B. Final

The licensing basis is satisfied because there is no significant effect on cable ampacity of installed 6.9-kV bundled 3-phase cables due to applied cable coating. An independent test showed that tightly packed power cables coated with Vinasco allows heat transfer just as good as air.

For short circuit ratings, TVA uses a minimum 2/0 AMG cable size for shielded power cable applications (6.9-kV service at WBH), which is conservative from an ampacity viewpoint. When routed in cable trays, these 2/0 AMG cables may be installed random lay (side-by-side with no space between cables). Shielded power cables larger than 2/0 AMG (4/0 AMG through 500 MCM) are grouped as 3-phase feeders and stacked in pyramids and separated from other grouped cable bundles by a nominal distance equal to the radius of the largest cable. A typical worst case arrangement of these cables is shown in Detail B of Figure 1. This spacing is provided to minimize the induced electro-motive forces (EMF) between phases when the cables are under load, and it does provide a more conservative design to more readily allow produced heat to be dissipated. However, the minimum spacing between cable bundles may be less where cables enter or exit the tray and at tray fittings, such as tees and crosses (i.e., the cable bundles may be in contact with each other).

The ampacities of shielded power cables installed in cable trays are determined from Electrical Design Standard DS-El2.1.2 for 90° C maximum copper conductor temperature in a 40° C ambient. The ampacity values for these cables given in DS-El2.1.2 are more conservative than the 80 percent factor suggested in ICEA S-54-440 for converting ampacities of cables in free air to cable trays. The cable designer considers ampacity derating of power cables when he sizes the cable for its application, including short circuit handling capability and to maintain suitable voltage regulation. In addition, motor circuits are conservatively sized for 125 percent of motor ratings.

Where cable coating is required to meet fire protection requirements, it is TVA practice to coat exposed surfaces of cables including the spaces between bundles of shielded power cables. The coating is applied to a nomina; 3/16-inch  $\pm 1/16$ -inch wet thickness. With reference to Detail B of Figure 1, it should be noted that the coating itself between cable bundles is not a heat source; instead the coating is an excellent conductor of heat, based on independent laboratory tests.

Testing performed for Vimesco by the Factory Mutual Research (FM) (Report No. J.I. OFOQ5.AF) concluded that with two wet coat thicknesses of 1/8-inch each (1/4-inch maximum thickness which is upper limit of TVA design), applied sequentially between tests, the ampacity decreased only by 1.62

BLACK & VEATCH EVALUATION SHEET (Continuation Sheet)

# 5. Licensing Basis Satisfaction (continued)

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#### B. Final

percent, which TVA considers insignificant. The FM tests were performed on power cables arranged in cable trays, uniformly stacked three cables deep, as shown in Detail A of Figure 1. The intent of the cable arrangement was to simulate a 40 percent tray fill (the actual fill was 43 percent) and to have all cables (except the ones located in the corners of the tray) touch other cables on at least three sides. This arrangement essentially eliminates air paths (convection) between the conductors and causes an opposite effect in that there is one heat source surrounded by other adjacent heat sources. For this reason, the tests as performed represent a worst case situation. The 2/0 AWG cables shown in Detail B of Figure 1, represent the same configuration as that tested, in that cables touch each other. The majority of the cables are 2/0 AWG for 6.9-kV service. Again, the coated 3-cable bundles do not touch, except as described above, and the coating provides a conductive path for heat dissipation. Furthermore, the test shows the heat transfer between the tightly packed cables coated with Vimasco and air paths is so good that the coating need not be considered in the design of the cable system.

Based on the above evaluation, TVA concludes that the installed cable configuration, including cable coating, requires no further derating of the cable bundles, and it satisfies the licensing basis.

March 1, 1984 - Nonconformance WBNEEB 8401R2 (EEB 840214 918) identified a significant condition in which documentation was not available to show that Class IE 6900-volt cable will not exceed its rated maximum continuous copper temperature of 90 C when installed in cable trays and covered with flame retardant coating.

A study (EEB 840203 901) was performed which showed that adequate ampacity exists for cables after derating for the cable coating. Therefore, the licensing bases is satisified.

-Conductive host transfer path only, no convective path

-- Cable tray

-Cable coating (cocoon coating of cables)

Mockup Arrangement For Factory Mutual Research Ampacity
Test On Coated Cables

DETAIL A

Cable bundles > than % AWG

Conductive path;

No heat source, typical

Cable tray

Cable coating on exposed surfaces of cables

 $A = \frac{d_1}{2}$  or  $\frac{d_2}{2}$ , whichever is larger

 $B = \frac{dz}{2}$  or  $\frac{dz}{2}$ , whichever is larger

C - 2

Typical Worst Case Arrangement Of Coated Medium-Voltage (8 KV) Power Cables Installed At Watts Bar Nuclear Plant

DETAIL B

Figure 1
Typical Arrangement Of
Insulated Power Cables
Coated With Vimasco 2-8

B&V (G 901) TF Cat. 39



# FAILURE AND SAFETY EVALUATIONS FOR CATEGORY 4

# Description\*

Failure to design the auxiliary feedwater system as specifically described in the FSAR.

# Discussion

Several minor documentation discrepancies were identified which were judged to represent no safety concerns. The other findings included discrepancies concerning: (1) ERCW to AFW valve control switch wiring, (2) thermal overload and torque switch bypass circuitry, (3) containment vessel modeling and minimum eccentricity requirements, and (4) piping design input spectrum limits and seismic spectral responses. These and their generic examples were reviewed and no conditions which jeopardize the safe operation or safe shutdown of the plant were identified.

# Conclusion

These deviations, had they not been identified and corrected, would not have prevented the performance of any nuclear safety function.

\*EN DES Calculation, Black and Veatch Task Force Category 4 - Discrepancies
Between FSAR and Design Documents (NEB 840319 219).

# SAFETY EVALUATION FOR CATEGORY 11

# Description\*

Flanges for the safety injection system pressure relief valve 1-63-627 fail to qualify for the normal operating conditions.

## Discussion

As a result of Black and Veatch finding F331 and F373, two flanges for the safety injection system pressure relief valve 1-63-627 were identified as failing to qualify for the normal operating conditions but are qualified for the faulted conditions. This pressure relief valve is downstream of the train B RHR heat exchanger and upstream of valve FCV-63-94-B containment isolation valve. Valve 1-63-627 protects the piping system against overpressurization and its discharge flows into the pressurizer relief tank. The failure evaluation concluded that the flange qualification failure will decrease the operating life of the flange and increase the possibility for flange leakage. This leakage results from a gradual degradation of the flange bolts but a flange bolt break will not occur. The flange leakage will not prevent the valve from performing its pressure relief function.

# Conclusion

This deviations, had it not been identified and corrected, would not have prevented the performance of any nuclear safety function.

\*EN DES Calculation, Black and Veatch Task Force Category 11 - PROB N3-63-5A Safety Evaluation (NEB 840316 221).

## FAILURE SAFETY EVALUATION FOR CATEGORY 14

## Description\*

Various supports in the auxiliary feedwater system of Watts Bar unit 1 were not modified, redesigned, or initially designed per the revised analysis of ECN 2576.

## Discussion

There were 382 generic deficiencies identified in various Watts Bar unit 1 systems. The problem was not applicable to unit 2. Six of these 382 represented conditions for which changes were warranted to improve resultant construction. Failure evaluations for three of the six support deficiencies concluded that pipe failure would not occur as a result of the deficiencies. Safety evaluations for the other three support deficiencies concluded that even if pipe failures resulted, these failures would be accommodated within system nuclear safety requirements.

# Conclusion

These deviations, had they not been identified and corrected, would not have prevented the performance of any nuclear safety function.

\*EN DES Calculation, Black and Veatch Task Force Category 14 - Seismic Support Review - Safety Evaluation Revision 1 (NEB 840316 222).



# SAFETY EVALUATION FOR CATEGORY 23

# Description\*

There were no provisions in the control circuit for torque switch bypass and thermal overload bypass indication in the main control room for FCV-1-51.

# Discussion

These supplemental design features would mitigate the consequences of certain single failure (i.e., valve steam binding). Their failure to be designed does not prevent valve operation. Their failure to mitigate certain single failures does not cause the single failure to have an impact greater than assumed in the safety analysis. Therefore, these design deficiencies do not create a safety problem from the single failure criterion standpoint.

# Conclusion

These deviations, had they not been identified and corrected, would not have prevented the performance of any nuclear safety function.

\*EN DES Calculation, Black and Veatch Task Force Category 23 - FCV-1-51 Safety Evaluation Revision 1 (NEB 840316 223).

# SAFETY EVALUATION FOR CATEGORY 30(2)

## Description\*

Inadequate current overload protection for the motor-driven feedwater pump lube oil pump and the electro hydraulic actuator motors on valves 1, 2-PCV-3-122 and 1, 2-PVC-3-132.

# Discussion

As a result of the Black and Veatch independent review it was identified that there was inadequate current overload protection for the motor-driven auxiliary feedwater pump lube oil pump and the electro hydraulic actuator motors on valves 1, 2-PCV-3-122 and 1, 2-PVC-3-132. The current overload protection is intended to reduce the consequencies of a fault and not prevent a fault. The range of possible failure modes that could result in overload currents include shorted windings to locked rotors. The absence of thermal overload protection could result in equipment becoming inoperable if a fault occurred. The lack of current overload protection would not prevent the safe operation or the safe shutdown of the plant based on two facts: (1) The function  $\mathcal{A}$  i protective device is to reduce the consequences of a fault and does not initiate or prevent the fault, (2) The credible worst case scenario is within the plant design basis which includes provisions for initiating events as well as single failures such as the loss of one motor-driven auxiliary feedwater pump (reference WBM FSAR, Section 10.4.9.1).



Page 6 of 9

# APPENDIX D

# SAFETY EVALUATION FOR CATEGORY 30(2)

(Continued)

# Conclusion

These deviations, had they not been identified and corrected, would not have prevented the performance of any nuclear safety function.

\*EN DES Calculation, Black and Veatch Task Force Category 30 - Safety

Evaluation of Inadequate Electrical Protection on Motors (NEB 840207 220).



#### APPENDIA D

# SAFETY EVALUATION FOR CATEGORY 35

## Description\*

Instantaneous trip setting for motor-operated valve breakers is not in accordance with EN DES criteria and vendor recommendations.

# Discussion

As a result of Black and Veatch finding F137, 444 Class IE circuit breakers were identified that had instantaneous current trip settings higher than the 1300 percent above motor full load current specified by the National Electrical Code and EN DES Standard DS E9.21. These high trip settings did not provide the proper short-circuit coordination between the circuit breaker, and their respective thermal overloads and under fault conditions equipment damage can occur. While these high trip settings were found to violate good design practice and could lead to a motor control center failure, the high trip settings would not prevent the safe operation or the safe shutdown of the plant. This conclusion is basel on the facts that (1) the function of a protective device is to reduce the consequences of a fault and does not prevent the fault, and (2) the credible worst case scenario is within the plant design basis which includes provisions for initiating events as well as single failures such as the loss of a IE motor control center (reference WBN FSAR, Section 8.3.1).

# Conclusion

These deviations, had they not been identified and corrected, would not have prevented the performance of any nuclear safety function.

\*EN DES Calculation, Black and Veatch Task Force Category 35 - Safety Evaluation of High Instantaneous Current Circuit Breakers Settings (NEB 840207 222).



Page 8 of 9

## APPENDIX D

# SAFETY EVALUATION FOR CATEGORY 37

# Description\*

The configuration of valve control circuits allows both the red and green indicating lights on the unit control board to be dimly lit upon the malfunction of the P-Auto contact in the open position.

## Discussion

As a result of Black and Veatch finding F112, 28 valve control circuits were identified that would allow the red and green indicating lights on the unit control board to both dimly light when a switch contact malfunction occurred. This results from a sneak circuit in the existing design and can mislead the operator concerning the valve's position. When both lights are brightly lit the valve is between fully closed and fully open. When the red light alone is brightly lit the valve is open and when the green light alone is brightly lit the valve is closed. Having both lights dimly lit could falsely lead the operator to think that the valve was in travel while, in fact, it was either fully closed or fully open. Twenty-four of the twenty-eight valves affected are isolation valves and the remaining four valves control flow from the refueling water storage tank to the chemical and volume control system charging pumps. No operator action to safely mitigate an accident requires the valve position indications. The sneak circuits does not interfere with the electrical circuits used for the manual control of the valve positions. The existing design basis accommodate single failure such as a malfunction of a control switch P-Auto contact through design of redundant and independent trains.

Page 9 of 9

APPENDIX D

SAFETY EVALUATION FOR CATEGORY 37

(Continued)

# Conclusion

These deviations, had they not been identified and corrected, would not have prevented the performance of any nuclear safety function.

\*EN DES Calculation, Black and Veatch Task Force Category 37 - Safety Evaluation of Indicating Light Sneak Circuits (NEB 840207 221).

APPENDIX E

Glossary of Terms

The evaluation of the information resulting from the independent design review required the use of some nonstandard terminology. This appendix describes the meaning and application of these terms within this report.

Licensing commitments - All docketed commitments relevant to the work
activities of designing and constructing as well as to the management systems
for controlling, inspecting, testing, auditing, and recording these work
activities.

Licensing bases - Those bases and criteria for design/construction specified in TVA's licensing application to meet the functional licensing requirements. These include design and construction work process specifications (i.e., welding code), as well as product specifications (i.e., hanger dimensions) which were developed from other licensing commitments. The licensing bases are the subset of all licensing commitments which does not include management controls.

# ATTACHMENT 3B PART 2

ADDITIONAL ATTACHMENTS REFERENCED IN
THE RESPONSE TO QUESTION 4
ON THE BLACK AND VEATCH INDEPENDENT
DESIGN VERIFICATION PROGRAM AS FORWARDED
IN THE MAY 30, 1985, LETTER FROM
T. M. NOVAK TO H. G. PARRIS

EVALUATION SHEET

Rev. R2 Date  $\frac{3/13/8}{}$ 

l. Task Force Category 3 for Watts Bar Nuclear Plant - Unit 1

2. Task Force Category Description and Related B&V Findings: Logic/control drawings do not agree with electrical drawings: F101, F102, F103, F104, F105, F106, F107, F110, F111, F114, F115, F116, F117, F123, F124, F127, F129, F130, F131, F141, F802, F803, F804, F805, F806.

## 3. Evaluation for Cause

- A. Preliminary
  - Inadequate drawing/checking of drawing prior to issue.
  - Inadequate recognition of need to revise companion drawings during design change process.
- B. Final
  Failure to consistently implement design review procedures as required
  in EN DES engineering procedure EP 4.25, "Design Review and Interface
  Coordination of Detailed Construction and Procurement Drawings."

Resp. Org. ansopp 3/14/84 Task Force Concurrence 2/16/84

- 4. Evaluation for Generic Examples
  - A. Preliminary

Problem is generic to logic, control, schematic, and connection drawings throughout WBN Unit 1.

B. Final - To determine generic implications, WBP reviewed the component cooling (70), containment spray (72), and residual heat removal systems (74) to identify mismatches in the logic, schematic, and connection diagrams for those systems. WBP then evaluated the seriousness and important of each mismatch and of the aggregate. Based upon this review, WBP concluded that the present TVA design for all safety systems is fully adequate for correct installation and operation of Watts Bar Nuclear Plant, with two exceptions: (1) instantaneous trip settings of molded case circuit breakers, (2) functional errors on logic diagrams. See Continuation Sheet (page 7).

Resp. Org. amesoph 3 1/4/84 Task Force Concurrence 1/2 free 3/16/84

- 5. Licensing Basis Satisfaction
  - A. Preliminary

Not satisfied for safety systems identified in FSAR section 7. Satisfied for all other systems.

B. Final - FSAR Section 7 identifies functional safety requirements for all safety systems. The licensing bases was not violated for any of the identified Black and Veatch findings in this category. However, the expanded, three system review described in Section 4 revealed licensing problems in two areas: (1) licensing basis was not satisfied for instantaneous ttripsettings for molded case circuit breakers, (2) licensing commitments were not satisfied for logic diagram functional requirements.

Resp. Org. amisoph 3 14/84 Task Force Concurrence

- 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work
  - A. Preliminary

NCR SWP 8267 (currently nonsignificant) and ECN 3683 only address correction of B&V identified drawing errors in the auxiliary feedwater system. TVA's Level 1 response to B&V finding F101 does not address all the effects of the existence of inaccurate drawings during design, construction, and operation.

B. Final

No ongoing corrective action was in place at the time of the Black and Veatch review.

Resp. Org. amisoph 3/14/84 Task Force Concurrence 3/16/84

- 7A. Identification of Corrective Action for Completed Work
  - A. Preliminary

All safety system logic, control, schematic, and connection diagrams need to be reviewed and revised to be consistent with design criteria and each other. As discrepancies are corrected, the impact on internal safety analyses and previous licensing submittals must also be evaluated.

B. Final - WBP initiated the following ECNs to incorporate corrective actions for the findings identified in this category: 3647, 3650, 2816 and 3683. The following FCRs were also accepted from CONST: E3458 and E3508. Additionally, WBP initiated ECNs 4358 and 4360 to correct findings identified in the expanded, three safety review addressed in Section 4. ECN 4666 has been issued to correct logic diagram errors identified in the FSAR logic review, also described in Section 4, to be completed by march 30, 1984.

Resp. Org. amoopp 3/14/04 Task Force Concurrence When 3/16/84

- .8A. Implementation and Inspection of Corrective Action for Completed Work
  - A. Preliminary
    - B. Final FCR E3458 Completed (SWP 830125 153); FCR E3508 Completed (SWP 830217 101); ECN 2816 Completed - Closure Sheet 95 (SWP 830203 019); ECN 3334 Completed -Closure Sheet 101 (WBP 830624 027); ECN 3647 Completed - Closure Sheet 103 (WBP 830829 014); ECN 3650 Completed - Closure Sheet 103 (WBP 830829 014); ECN 3683 Completed - CLosure Sheet 101 (WBP 830624 027); ECN 4358 Completed; ECN 4360 Completed - Closure Sheet 118 (WBP 840123 507); ECN 4246 Completed - Closure Sheet 112 (WBP 831114 521); ECN 4358 Completed; ECN 4360 Completed - Closure Sheet 118 (WBP 840123 507); ECN 4246 Completed - Closure Sheet 112 (WBP 831114 521); ECN 4666 issued.

- 9A. Identification and Evaluation of Ongoing Corrective Action for Future Work
  - A. Preliminary

Task force knows of no ongoing programmatic corrective action.

Final

N/A

Resp. Org. Linespop 3/6/04 Task Force Concurrence 26/16/84

10A. Identification of Corrective Action for Future Work

A. Preliminary

Must be determined by evaluation of cause(s).

B. Final

Implementation of engineering procedures training and utilization program initiated by M. N. Sprouse to Those listed dated February 26, 1982 (NEB 820226 255).

Resp. Org. UNISOPH 3/14/84 Task Force Concurrence 3/6/84

|      | A. Preliminary                                                                |
|------|-------------------------------------------------------------------------------|
|      |                                                                               |
|      |                                                                               |
|      |                                                                               |
|      |                                                                               |
|      | B. Final                                                                      |
|      | Training in EN DES EP 4.25 completed on July 28, 1982, for I&C Section.       |
|      |                                                                               |
|      |                                                                               |
|      | Resp. Org. Linuspy 31/104 Task Force Concurrence 2/2/2002 316184              |
|      |                                                                               |
| L2A. | Verification of Effectiveness of Corrective Action for Future Work            |
|      |                                                                               |
|      | A. Preliminary                                                                |
|      |                                                                               |
|      |                                                                               |
|      |                                                                               |
|      | B. Final                                                                      |
|      | The basis for QMS closure of this category evaluation sheet is noted in       |
|      | J. W. von Weisenstein's memorandum to Quality Management Staff Files dated    |
|      | December 10, 1984 (QMS 841210 205).                                           |
|      |                                                                               |
|      | Resp. Org. June 13 1/84 Task Force Concurrence If June 12/3/184               |
|      | Resp. Org. / 12/3/184  Task Force Concurrence 12/3/184                        |
| 6B   | Identification and Fundamenta of Co.                                          |
| 01.  | Identification and Evaluation of Ongoing Corrective Action for Completed Work |
|      | A: Preliminary                                                                |
|      | No viable ongoing corrective action for nonsafety systems.                    |
|      |                                                                               |
|      |                                                                               |
|      |                                                                               |
|      | B. Final                                                                      |
|      | NA                                                                            |
|      |                                                                               |
|      |                                                                               |
|      | ·                                                                             |
|      | Resp. Org. // Task Force Concurrence //                                       |
|      |                                                                               |
|      |                                                                               |
|      |                                                                               |

11A. Implementation of Corrective Action for Future Work

| 75. | rue. | ntification of Corrective Action for Completed Work                                                                                                          |       |          |
|-----|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------|
|     | Α.   | Preliminary                                                                                                                                                  |       |          |
|     |      | Corrective action should address all nonsafety systems and should co<br>on a priority based upon system importance to nuclear safety and pla<br>operability. | rrect | drawing  |
|     | В.   | Final                                                                                                                                                        |       |          |
|     |      | NA                                                                                                                                                           |       |          |
|     |      |                                                                                                                                                              |       |          |
|     | Res  | p. Org/ / Task Force Concurrence                                                                                                                             | /     | <u>/</u> |
| 8B. | Imp  | lementation and Inspection of Corrective Action for Completed Work                                                                                           |       |          |
| •   |      | Preliminary                                                                                                                                                  |       |          |
|     |      |                                                                                                                                                              |       |          |
|     |      |                                                                                                                                                              |       |          |
|     | в.   | Final                                                                                                                                                        |       |          |
|     | ٠.   | NA NA                                                                                                                                                        |       |          |
|     |      |                                                                                                                                                              |       | ·        |
| •   |      |                                                                                                                                                              | •     |          |
|     | Res  | p. Org. / / Task Force Concurrence                                                                                                                           | /     | /        |
| 9B. | Ide  | ntification and Evaluation of Ongoing Corrective Action for Future Wo                                                                                        | rk    |          |
|     | Α.   | Preliminary                                                                                                                                                  |       |          |
|     |      |                                                                                                                                                              |       |          |
|     |      |                                                                                                                                                              |       |          |
|     | в.   | Final                                                                                                                                                        |       |          |
|     |      | NA                                                                                                                                                           |       |          |
|     | -    |                                                                                                                                                              |       |          |
|     |      |                                                                                                                                                              |       |          |
|     | Res  | p. Org/ / Task Force Concurrence                                                                                                                             | /     | /        |

| A. Freliminary            |                |                                 |       |
|---------------------------|----------------|---------------------------------|-------|
|                           |                |                                 |       |
|                           | ·              | •                               |       |
|                           |                | •                               |       |
| B. Final                  |                | •                               |       |
| NA                        |                |                                 |       |
| 7071                      | -              |                                 |       |
|                           |                |                                 |       |
| Resp. Org.                | /- /           | Task Force Concurrence          | 1 1   |
|                           |                |                                 |       |
| llB. Implementation of Co | orrective Acti | on for Future Work              |       |
| A. Preliminary            |                |                                 |       |
|                           |                | •                               |       |
|                           |                |                                 |       |
|                           |                |                                 |       |
| B. Final                  | •              |                                 |       |
| 1                         |                |                                 |       |
| NA                        |                |                                 |       |
|                           |                | •                               |       |
|                           |                |                                 |       |
| Resp. Org.                | /_/            | Task Force Concurrence          |       |
| 2B. Verification of Effa  | ectiveness of  | Corrective Action for Future Wo |       |
|                           | octiveness of  | coffective Action for Future Wo | rk    |
| A. Preliminary            | ·              |                                 |       |
|                           |                | ·                               |       |
|                           |                |                                 |       |
|                           |                |                                 |       |
| B. Final                  |                |                                 | , · · |
| N'A                       |                |                                 |       |
| ·                         |                |                                 |       |
|                           |                |                                 |       |
| Resp. Org.                | / /            | _ Task Force Concurrence        | / /   |
|                           |                |                                 |       |
|                           |                |                                 |       |

10B. Identification of Corrective Action for Future Work

# BLACK & VEATCH EVALUATION SHEET (Continuation Sheet)

Evaluation of Generic Examples

B. Final (Continued)

WBP has previously addressed instantaneous trip settings on Black and Veatch category 35, including all generic examples and corrective actions. WBP is presently checking all logic diagrams contained in the WBNP FSAR against the appropriate schematic diagrams to identify any additional functional mismatches. This review will be completed by March 30, 1984.

TVA 44 (08-9-48)

UNITED STATES GOVERNMENT

# Memorandum

TENNESSEE VALLEY AUTHORITY

OMS

'841210 205

TO

Quality Management Staff Files

FROM

J. W. von Weisenstein, 384 SPB-K

DATE :

December 10, 1984

841214T0025

SUBJECT:

ASSESSMENT OF ADEQUACY OF CORRECTIVE ACTION FOR BLACK AND VEATCH TASK FORCE

CATEGORY 3 - WATTS BAR UNITS 1 AND 2

For this category, the TVA task force for review of Black and Veatch findings determined that corrective action was required for completed and future work. QMS performed a surveillance in accordance with the attached scoping document to assess the adequacy of corrective action implementation for completed and future work, as well as the effectiveness of corrective action for future work. The results of that surveillance, contained in the attached surveillance report, verified the adequacy of the work accomplished.

Based upon our assessment of category 3, we conclude that this category can be closed by signing and dating item 12A, "Verification of Effectiveness of Corrective Action for Future Work."

J. W. von Weisenstein

Attachments

cc: E. G. Beasley, W12C61 C-K (Attachments)

J. S. Colley, 374 SPB-K (Attachments)

H. L. Jones, W10D224 C-K

Principally Prepared By: J. W. von Weisenstein (7706)

300). 12/ cc

12/10/84 - EGB:MBP

cc (Attachments):

R. W. Cantrell, W11A9 C-K

MRDS, WSB63 C-K



02700

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QUALITY HAMAGEMENT STAFF
SURVEILLANCE REPORT FOR THE ASSESSMENT
OF THE EFFECTIVENESS OF CORRECTIVE ACTIONS
IDENTIFIED IN THE TASK FORCE REPORT ON THE
BLACK AND VEATCH FINDINGS

PLANT: Watts Bar Nuclear Units 1 and 2

CATEGORY: 3

Prepared By: Donald ( White Date: 12/7/84 Date: 12.7.84

Concerns: NO /X / Yes / / (if yes, identify below) Results:

I. Management Summary:

The design processes evaluated are outlined in the attached surveillance scoping document and were determined to be in compliance with requirements.

II. Conclusions and Recommendations:

Based upon the results of this surveillance, implementation of corrective action for completed and future work has been accomplished as committed by the TVA task force evaluation sheets for category 3.

#### III. Details:

- A. Performed the following surveillance activities to verify implementation of corrective action for completed work:
  - Sample one or more systems selected for the generic review and compare the sampling results to the review results.

Results: For this sample review, the containment spray system (system 72) was selected to verify logic, control, schematic, and connection diagram compatability. The technical review and evaluation for sections III.A.1 and III.A.2 of this surveillance report were performed by Frank E. Denny, an electrical engineer in the Quality Hanagement Staff. The following diagrams were used for the sample review:

Logic Diagram Control Diagram Schematic Diagram Connection Diagram

47W611-72-1 R12 47W610-72-1 R11 45W760-72-1 R9 45W1645-9 R13
45W1724-1 R5
0126D4529 R905
0126D454\*2-3 R913

Page 1 of 5

Specific components were selected from logic diagram 47W611-72-1 R12 to verify compatibility. Component selection included four switches, IS 72-10, HS 72-10A, HS 72-10B, and HS 72-10C, three of which provide start/stop signals to the containment spray pump B and a transfer switch. Sample review results revealed no discrepancies regarding diagram compatibility for the identified switches.

TVA's generic review results for the diagrams identified above are stated below. Discrepancies identified during the review were to be corrected under ECMs 4358 and 4360, as appropriate.

| Diagram and Revision at | Diagram and Revision That Incor |
|-------------------------|---------------------------------|
| Time of TVA Review      | porated ECMs 4358 and/or 4360   |
| 47W611-72-1 R9          | 47W611-72-1 R10 (BCN 4358)      |
| 47W610-72-1 R10         | No discrepancies identified     |
| 45\760-72-1 R6          | 45W760-72-1 R8 (ECW 4358)       |
| 45N1645- , R8           | 45N1645-9 R12 (ECN 4358)        |
| 45W1724-1 R3            | No discrepancies identified     |
| 0126D4529 R5            | No discrepancies identified     |
| 0126D4542-3 R11         | No discrepancies identified     |
|                         |                                 |

 Sample one or more logic diagrams in FSAR and compare to schematic diagrams to identify any functional mismatches.
 Compare these sampling results to those results obtained for the similar review.

Results: For this sample review, the safety injection system (system 63) was selected to verify whether functional mismatches existed between the logic and schematic diagrams. The following diagrams were used for the sample review:

#### Logic Diagram

Schematic Diagram

47W611-63-1 R6

45W600-99-1 R4 1082H70 R V

Here again, specific components were selected from the logic diagram for the verification. Component selection included two manual safety injection signal switches HS 63-133A and HS 63-133B and a safety injection signal reset switch HS 63-134A. Sample review results revealed no discrepancies regarding functional mismatches for the identified switches.

TVA's FSAR logic review results revealed discrepancies with logic diagram 47W611-63-1. Discrepancies identified during the review were to be corrected under ECNs 4666 and 4667, as appropriate. Logic diagram 47W611-63-1 was revised to

Page 2 of 5

incorporate ECMs 4666 and 4667. This was accomplished under R5 to 47W611-63-1.

 Sample deficiencies identified to verify completed or controlled corrective action.

Results: J. C. Standifer's memorandum to H. L. Jones dated September 29, 1983 (WBP 830929 024), documented the results of TVA's three system generic review. TVA issued ECMs 4358, 4359, and 4360 to correct mismatches in the logic, control, schematic, and connection diagrams as a result of the review. TVA also issued ECMs 4666 and 4667 to correct functional mismatches in the logic and schematic diagrams as a result of the FSAR logic review. Activities associated with these ECMs have been completed. The following identifies each ECM and respective closure sheets.

| <u>ecn</u> | Closure Sheet No.    |
|------------|----------------------|
| 4358       | 121 (WBP 840223 555) |
| 4359       | 118 (WBP 840123 506) |
| 4360       | 118 (WBP 840123 506) |
| 4666       | 133 (WBP 840608 500) |
| 4667       | 133 (WBP 840608 500) |

B. Performed the following surveillance activities to verify implementation of corrective action for future work:

Verify implementation of EP training to NEB 820226 255 by selected section(s) responsible for this work:

Results: I&C BP training rosters were observed to verify that BP training had been conducted for BP 4.25. The observation revealed that an BP training roster did exist for BP training on BPs 4.01, 4.02, 4.04, and 4.25. This training was conducted by L. T. McCord July 28, 1982.

C. Performed the following surveillance activities to assess the effectiveness of corrective action for future work:

Assess the effectiveness of the EP training based upon the evaluation of the adequacy of some work output (work which was initiated after July 28, 1982).

Results: For this assessment, a working ECN 5231 (issued Movember 6, 1984) initiated by the I&C section of WBEP was selected for review because the change warranted revisions to electrical logic diagrams and possible schematic and connection diagrams. The review of ECN 5231 was an attempt to verify adequate implementation of design change control requirements

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where branches/groups/sections other than I&C may be affected. ECN 5231, in part, required the I&C section to revise logic diagrams 47W611-3-3 R5 and 47W611-3-4 R5 to identify specific time delay relay settings for valve actuation as a result of preoperational tests conducted at WBM. Logic diagram 47W611-3-3 R5 was revised to depict a 4-second time delay relay setting for flow control valves FCV-3-136A and FCV-3-136B and an 8-second time delay relay setting for flow control valves FCV-3-179A and FCV-3-179B. Logic diagram 47W611-3-4 R5 was revised to depict a 7-second time delay relay setting for level control valves LCV-3-173 and LCV-3-174.

The logic diagrams were squadchecked (squadcheck No. JLD-97) to the wiring section of WBEP to evaluate the changes for possible revisions to schematic and connection diagrams. Through the squadcheck process, the wiring section revised schematic diagram 45N600-57-5 R5 to depict a 4-second time delay relay setting for relays TD1 and TD2 associated with flow control valves FCV-3-136A and FCV-3-136B and an 8-second time delay relay setting for relay TD3 associated with flow control valves FCV-3-179A and FCV-3-179B. Schematic diagram 45N600-57-22 R3 was revised to depict a 7-second time delay relay setting for relay 74-B (train B) associated with level control valves LCV-3-173 and LCV-3-174. Connection diagrams were not revised as a result of the changes. Wiring section personnel stated that time delay relay settings are identified on schematic and logic diagrams only. Parallel squadchecks were also issued by the I&C section of WBEP to EEB (squadcheck No. 6066) and MEB (squadcheck No. 6069) for evaluation of the proposed changes associated with ECN 5231. It should be noted that the specific changes identified above were observed "on-the-board" awaiting verification and approval by BEB.

It is evident that the I&C section of WBEP has implemented adequate design change control requirements regarding changes prompted by BCN 5231. This appears to be indicative of the EP training identified in B.1. above.

#### IV. Documents Reviewed:

- 1. EN DES NCR WBNSWP8267 R1 (WBP 830818 051)
- 2. ECN 4358 (WBP 831102 518)
- 3. BCN 4359 (WBP 831107 516)
- 4. ECN 4360 (WBP 831107 512)
- 5. ECN 4666 (WBP 840315 518)
- 6. ECN 4667 (WBP 840315 522)
- 7. ECM Closure Sheet 121 for ECM 4358 (WBP 840223 555)
- 8. ECN Closure Sheet 118 for ECNs 4359 and 4360 (WBP 840123 506)
- 9. ECN Closure Sheet 133 for ECNs 4666 and 4667 (WBP 840608 500)
- H. N. Sprouse's memorandum to Those listed dated February 26, 1982 (NEB 820226 255)

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- 11. J. C. Standifer's memorandums to H. L. Jones dated September 29, 1983 (WBP 830929 024), and October 5, 1983 (WBP 831005 026)
- 12. D. H. Verrelli's NRC Inspection Report to H. G. Parris dated
- October 4, 1984 (MEB 841016 609)

  13. E. Gray Beasley's memorandum to OEDC Hanager's Office Files dated August 2, 1983 (EDC 830802 401)
- 14. SWP (I&C) Training Roster for RN DES-EPs 4.01, 4.02, 4.04, and 4.25
- dated July 28, 1982 15. Squadcheck No. JLD-97
- 16. Appendix E (Glossary of Terms) of Black and Veatch Final Report 17. Logic Diagrams 47W611-72-1 R12 and 47W611-63-1 R6
- 18. Control Diagram 47W610-72-1 R11
- 19. Schematic Diagrams 45W760-72-1 R9, 45W600-99-1 R4, and 1082H70 R V.
- 20. Connection Diagrams 45N1645-9 R13, 45W1724-1 R5, 0126D4529 R905, and 0126D4542-3 R913

## V. <u>List of Personnel Contacted</u>:

| Нате            | Title                        | Organization |
|-----------------|------------------------------|--------------|
| E. Gray Beasley | Staff Chief                  | OMS          |
| R. E. Comeau    | Design Engineering Associate | EEB (WBEP)   |
| S. A. Cutts     | Electrical Engineer          | EEB (WBEP)   |
| J. L. Dorris    | Supervisor                   | EEB (WBEP)   |
| R. T. Graham    | Electrical Engineer          | EEB (WBEP)   |
| H. L. Jones     | Nuclear Engineer             | MEB          |
| L. T. McCord    | Electrical Engineer          | EEB (WBEP)   |
| W. M. Roop, Jr. | Supervisor                   | EEB          |
| H. J. Sarlitto  | Mechanical Engineer          | EEB (WBEP)   |
| S. R. Stout     | Muclear Engineer             | NEB          |
| E. R. Whitley   | Electrical Engineer          | EEB (WBEP)   |

### VI. Scoping Document (Attached)

QUALITY NANAGEMENT STAFF
SCOPING DOCUMENT FOR THE ASSESSMENT
OF THE EFFECTIVENESS OF CORRECTIVE ACTIONS
IDENTIFIED IN THE TASK FORCE REPORT ON THE
BLACK AND VEATCH FINDINGS

|                       | PLANT: Watts Bar      |                                     |
|-----------------------|-----------------------|-------------------------------------|
|                       | CATEGORY:             |                                     |
| Prepared By:<br>Date: | L.E. Brook            | Approved By: file - Character Date: |
|                       | <i>10 / 11 / 1. Y</i> |                                     |

I. Verification of Corrective Action Implementation for Completed Work

Perform the following surveillance activity:

Sample one or more systems selected for the generic review and compare the sampling results to the review results. Sample one or more logic diagrams in FSAR and compare to schematic diagrams to identify any functional mismatches. Compare these sampling results to those results obtained for the similar review. Sample deficiencies identified to verify completed or controlled corrective action.

II. Verification of Corrective Action Implementation for Future Work

Perform the following surveillance activity:

Verify implementation of EP training to NEB 820226 255 by selected section(s) responsible for this work.

III. Assessment of Effectiveness of Corrective Action for Future Work

Perform the following surveillance activity:

Assess the efficieness of the EP training based upon the evaluation of the adequacy of some work output (work which was initiated after July 28, 1982).

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| , <del></del> . Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ATTS BAR NUCLEAR PLANT  BLY PROJECT 10520  ECN NO. 1443  ATTACHMENT  SHEET               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | FINDINGS REPORT                                                                          |
| FINDING NUMBER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | FINAL CLASSIFICATION_                                                                    |
| F129                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | TYPE CATEGORY                                                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | (FILLED IN BY SERIOR REVIOU TEAM COLLINGAR)                                              |
| DESCRIPTION: REF. TVA DW.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 68 45W600-46-6, REV. 4 AND 45N600-57-5, REV.                                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | DELAY OF THE PART                                                                        |
| THE LIMIT SWITCH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | THAT ACTUATES RELAY BB WHICH, IN TURN,                                                   |
| INTERLOCKS WITH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | TIME DELAY RELAY TO 1 IS SHOWN TO                                                        |
| OPERATE WHEN TH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | HE"TRIP AND THROTTLE VALVE" (FCV-1-51) THIS DOES NOT AGREE WITH LOGIC                    |
| 15 FULLY OFEN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1-3-3 REV. 2 AND 46W 611-3-4 REV. 2 WHI                                                  |
| INDICATE THAT THE LIF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | MIT SWITCH ACTUATES WHEN FLV-1-51 IS HALF OP                                             |
| INITIATED BY Rande D.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Kiese D DATE Oct 29 1982                                                                 |
| The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s |                                                                                          |
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| 404 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                          |
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| SIGNATURE R.J. Shim                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | DATE Oct. 29, 1982 CATEGORY A                                                            |
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| PROJECT MANAGER'S ACTION REMARKS:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | RECOMMEND CLASSIFICAT TYPE CATEGORY                                                      |
| PROJECT MANAGER'S ACTION REMARKS: SIGNATURE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | RECOMMENDI CLASSIFICAT TYPE                                                              |
| PROJECT MANAGER'S ACTION REMARKS: SIGNATURE SENIOR REVIEW TEAM ACTIO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | RECOMMEND CLASSIFICAT TYPE CATEGORY                                                      |
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| r               | ONTRO                       | <u>د</u> د   | IZCUI           | TRY        | FOR               | THE                   | TRIP                   | AND                | THRO     | TTLE      | VAL                                          | VE LEC   | 4.51      | ) 01     | ERATE             | <u> </u> |
|                 |                             |              |                 |            |                   |                       | - · · ·                |                    |          |           |                                              | A        | BLAG      | er ti    | 16AZCH            | ,        |
|                 | UMEN                        | THE          | " TE            | P & A      | UT AL             | LOTTI                 | Æ \                    | /A L U             | 티니       | HAL       | F 0                                          | PEN:     |           |          |                   | ,        |
| U               | UHEN                        |              |                 | <u> </u>   | ID TH             | LOTT!                 | <u> </u>               | /A L V             | E IJ     | HAL       | - 0                                          | PEN:     |           |          | <b>U</b> 10 P S11 |          |
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| Ų               |                             |              |                 |            | HT CL             | <b>20</b> π1          | <u>.E. V</u>           | /A LV              | 트 以      | HAL       |                                              | PEN.     |           |          |                   |          |
| Ų               |                             |              |                 |            | ID TH             | <b>20</b> 771         | <u> </u>               | <u>/ &amp; L V</u> | 트 12     | HAL       |                                              | YEN.     |           |          |                   |          |
| Ų               |                             |              |                 |            | HT GI             | ωπι                   | Æ V                    | / <u>&amp; L V</u> | 트 너      | HAL       |                                              | YEN:     |           |          |                   |          |
| Ų               |                             |              |                 |            | HT el             | ωπι                   | EV                     | / <u>\$</u> Ł V    | E 13     | HAL       |                                              | YEN.     |           |          |                   |          |
| Ų               |                             |              |                 |            | HT GL             | ωπι                   | EV                     | / <u>A L V</u>     | E 13     | HAL       |                                              | YEN.     |           |          |                   |          |
| Ų               |                             |              |                 |            | JA TH             | <b>6</b> 0771         | -E V                   | <u> </u>           | E U      | HAL       |                                              | 752.     |           |          |                   |          |
| Ų               |                             |              |                 |            | HT el             | ωπι                   | EV                     | / <u>ALV</u>       | E 15     | HAL       |                                              | 762.     |           |          |                   |          |
| Ų               |                             |              |                 |            | HT el             | <b>19</b> π1          |                        | / <u>ALV</u>       | E 13     | HA C.     |                                              | 752.     |           |          |                   |          |
| Ų               |                             |              |                 |            | HT el             | <b>LOTTI</b>          |                        | / <u>A L V</u>     | E 13     | HA C.     |                                              | 750.     |           |          |                   |          |
| Ų               |                             |              |                 |            | TH GL             |                       |                        |                    |          |           |                                              |          |           |          |                   |          |
| Ų               | 21001                       | <i>N</i> 6   | FI              | 2.5        |                   | SEEA                  | SSOCIA                 |                    |          | S LIST, ( | REVE                                         | RSE SIDE |           |          |                   |          |
|                 |                             | NG Page      | F I             | 2.5        | SAMO              | SEE A                 | SSOCIA<br>D.P.         |                    |          | S LIST, ( | REVE                                         |          |           |          |                   | 707      |
|                 | CATE                        | NG Page      | F I             | 2.5        | SAMO              | SEE A                 | SSOCIA<br>D.P.         |                    |          | S LIST, ( | REVE                                         | RSE SIDE |           |          |                   | 707      |
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TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN.

## ENGINEERING CHANGE NOTICE NO. 3683

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#### SCOPE OF CHANCE ESTIMATE

WATTS BAR KUCLEAR PLANT

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BUILDING TORRINE BUILDING

SYSTEM/FEATURE: FEEDWATER CONTROL SYSTEM (46)

Revisions by this section will not require additional material

TRevisions by this section will require additional materials as listed below

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CHIEF, COOT PLANSIES AND CONTROL STAFF, MISCH S-C CHIEF, ADDITTETORIL SUFFORT MANCE, MICLIS S-C CHIEF, CLTIL SOCIOLISION SAMES, MICLIS S-C PLANT SUPERINTENDENT CHESTRUCTION PROJECT MARAGE MISS, VSMS C-E SSMS, 646 ESTE-E TEMPESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN.

## ENGINEERING CHANGE NOTICE NO. 3683

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Section Supervisor

# ENGINEERING CHANGE NOTICE COVER SHEET SWP 88 0214 569

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| Project Was                                                         | TS BAR NH               | CLEM PL                                          | WT                       | Affected Unit(s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 112                  |
| System or Feet                                                      | ure AL                  | Y FEEDH                                          | MER SYSTER               | 1 (3) NCR W                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | BN SWP8267           |
| Reference & D                                                       |                         |                                                  |                          | OGIC PRAWINGS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                      |
| FSAK                                                                |                         |                                                  |                          | PINDINGS FI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |
| _FSAK                                                               |                         |                                                  |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                      |
| PRAWINGS O                                                          | VOLVED                  |                                                  | te Branch                | PKGS AFFECTED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                      |
| DRAWINGS O                                                          | and Serviced A          | 25, or D                                         | ta Sheet Encincement     | SUPPORT SAMESES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Yes or No            |
| 8-4                                                                 |                         | <b>10</b> 10 10 10 10 10 10 10 10 10 10 10 10 10 | vailable                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <u> </u>             |
|                                                                     |                         | .* 9                                             | ECN is see               | Ty for A branch review:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                      |
| Trans.                                                              | ser sencirity of the    | . ,                                              | م کے کہ ا                | and The same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of th | 1-24-83              |
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| Mechanic                                                            | 6656 73                 | ~ <del>~~</del> _                                | Approved:                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                      |
| W. S.                                                               | " , <u>'</u>            | <u> </u>                                         | - CONTIN                 | CIVIL 10 MILE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Date                 |
| . The                                                               | V                       | <u> </u>                                         | —   FWZ                  | worderedore                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2-7-0                |
| OUCLEAR PROJECTI<br>Civil                                           | 1 DESIGN 640075         | <u> </u>                                         | ~ 9                      | Myen y. mg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Date                 |
| Electrica                                                           | . El                    | <u> </u>                                         | -   A V                  | TOTAL MARIE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2-2-1<br>Date        |
| Mech                                                                |                         | NO                                               | 1 227                    | Jilder to                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2-11-8               |
|                                                                     |                         |                                                  | Chief Nu                 | clear Engineer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Oate                 |
| F0881L, 27000 A                                                     | SPECIAL PROJECTS DESIGN |                                                  | <del></del>              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Yes or Ne            |
|                                                                     | ESIGN PROJECTS          | <u> NO</u>                                       |                          | or PSAR or FSAR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Verg No              |
| ARCHITECT                                                           | URAL SUFFERT SCANCE     | NO                                               | •                        | or Preoperational Test:<br>/es, Test No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | TVA 2-2              |
|                                                                     |                         |                                                  |                          | ckcharges involved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | NO                   |
|                                                                     |                         | _                                                |                          | valysis Required                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | NO                   |
| R-WSICAL WOR                                                        | Pre-Op   1st Fuel (1%T) |                                                  | <del></del>              | rmance Report Required                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | yes                  |
|                                                                     | Test Lead Pou           |                                                  | QA Applie                | rs<br>ystem Modified                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | No                   |
| United /52                                                          |                         |                                                  | Vendor(s)                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | MONE                 |
| Unitts                                                              |                         |                                                  |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                      |
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| CC (Atternmen                                                       | MA                      | 136 6-4                                          | /-II UI                  | 00 0 0 C 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                      |
| CHEF, MENTERS<br>CHEF, CIVIL DE<br>CHEF, ELECTRICA<br>CHEF, MENTERS |                         | <b>5</b> ~                                       | mill. Mina M             | es un curtan start, maser d<br>las Planssta, maser cal<br>Stree, Class cal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ~                    |

|    |                      | MNESSEE V                                |                                   |                                                  | DESIGN             |                  |                                                  | . (             | RING CHANGE<br>DATA SHEET N | NOTICE I                                            | 10. <u>3647</u> sauci                 | 7        |
|----|----------------------|------------------------------------------|-----------------------------------|--------------------------------------------------|--------------------|------------------|--------------------------------------------------|-----------------|-----------------------------|-----------------------------------------------------|---------------------------------------|----------|
|    | Te                   |                                          |                                   |                                                  | W                  | its Ber i        | Nudeer                                           | riegi,          | Spring City IN              | •                                                   |                                       |          |
|    | Fra                  | " FEE                                    | 141                               | et Men.<br>983                                   |                    | n. 204           | COLK                                             |                 |                             | Refere                                              | on by: 9, 0, Collision                |          |
|    | Prop                 |                                          | FRK                               |                                                  | MAC                |                  | SWP                                              |                 | 3 0214                      | 570                                                 | R 4                                   |          |
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|    | Groc<br>Head<br>Bran | di gi                                    | <i>o.</i> (                       | fle                                              |                    | _3               |                                                  |                 |                             |                                                     | 7                                     |          |
|    | <u>Chie</u><br>Proj  |                                          | ett.                              | R                                                | e Na               | (L. E.)          | n A                                              | mer             | SCOPE -                     |                                                     | Affected Units 1 2                    |          |
| \  | 5yst                 | em or Fee                                | ture                              | A                                                | 12161              | eky.             | F86                                              | DWA             | TER SYSTE                   | 7 (3)                                               |                                       |          |
| /  |                      | rence & O                                | escripti                          | on of C                                          | hange              | Â                | PEVIS                                            | ٠ ،             | CONTROL A                   | D 604                                               | IC PRAWINGS TO                        |          |
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|    |                      | اعر                                      | 14,1                              | E107                                             | , FL3              | 10,1             | F106                                             |                 | icr wen swf                 | 8267)                                               | ATRICA                                |          |
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|    | -                    |                                          |                                   |                                                  |                    |                  |                                                  |                 | - Ayy                       |                                                     |                                       |          |
|    |                      |                                          |                                   |                                                  |                    |                  | SEE A                                            | SSOCI           | ATED DRAWING                | S LIST, REV                                         | VERSE SIDE                            |          |
| 1  | REV.                 | OATE                                     | PRE.                              | SECT.                                            | GROUP              | CHIEF            | ECM                                              | O.P.            |                             | DESCRIP                                             | TION OF REVISION                      | TOTAL    |
| y. | 1                    | V-12-83                                  |                                   | 111                                              | 92                 | 1/4              | 77                                               | ادي             | ADDED 1                     | 024.                                                |                                       | 2        |
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| ,  | R'                   | No                                       | s as for                          |                                                  | A                  |                  |                                                  |                 | <u> </u>                    |                                                     |                                       |          |
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| •  | 915                  | , coat n.                                |                                   | 9 992 793                                        | L STATT.           | ATSELE (         | . — —<br>H                                       |                 |                             | Menin Tendent<br>From Mondert<br>Mi G-E<br>V Esta-e |                                       |          |
|    | CHIE                 | F. CITIL ES<br>F. CLECTOIC<br>F. SPECIAL | ALCOCEDIO<br>AL COGIO<br>PESICO P | G DOMECTO                                        | MESTER<br>NAMED, W | 년<br>1년36 년<br>년 | 1                                                |                 | 781: 72                     | Plati-e                                             |                                       |          |

#### ENGINEERING CHANGE NOTICE NO. 3447 DATA SHEET NO. \_\_\_\_\_

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| AFFECTED: | REMINING OR BANKARD                     | owe<br>REV.  | ISBUE<br>EXPOSTED                                | DATE<br>_ACTUAL                                  |                                                  | REMARKS                                          | 24 0 4 4 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 |
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| 112       |                                         | 13           | 4-H-85                                           | 4.13.83                                          |                                                  |                                                  |                                              |
| 1         | 478611-3-4                              | 3.           | 1                                                | J.                                               |                                                  |                                                  |                                              |
|           | 476605-8                                | 111          |                                                  | 2.24.13                                          |                                                  |                                                  |                                              |
|           | 478600-57                               | 4            |                                                  |                                                  |                                                  |                                                  |                                              |
| J         | 47W600-60                               | 4            | 1                                                | V                                                |                                                  |                                                  |                                              |
| 112       | 47W611-3-3                              | 3            | 1                                                | 4-13-83                                          |                                                  |                                                  | 1                                            |
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Attach. 1 to Data 54.1

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| · Revision                            |               |               | ill require addi           | additional            |                               | sted below   |
|---------------------------------------|---------------|---------------|----------------------------|-----------------------|-------------------------------|--------------|
| Item                                  | Unit 1<br>Qty | Unit 2<br>Qty | Procured By (EN DES/CONST) | PR, Reqn,<br>or Contr | Requested<br>Delivery<br>Date | Remarks      |
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## ENGINEERING CHANGE NOTICE NO. 3647 DATA SHEET NO. 2

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W. T. ESTES
Preparer

Section Supervisor

| TENNESSEE VALLEY AL<br>XVISION OF ENGINEERI |                         | :<br>ENGI               | NEERING CHANG                 | E NOTICE NO.    | 3647           | BRANCH SWF        |
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TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN.

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## ENGINEERING CHANGE NOTICE

COVER SHEET 83 0120 524 (Before Issuance of Operating License) ECN NO. 3650 TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN Wans Bar Nuclear Flant, Spring City, TN To: Construction Project Manager. SWP 204 GB-K From: Design Project Manager DATE JAN 20 1983 Budget item: 221 Was IJ Analysis Required: CHARLES C. FISHER SWP **SCOPE** Project WATTS BAR NUCLEAR PLANT Affected Unit(s) 1 & 2 System or Feeture (3) AUXILIARY FEEDWATER x(3)-1 WBNSWP BZET PI33: PI41 TRANSE **Oats** Sheet Approved Required YES 12-14-8Z MA MO YES Electrical #2 NA Mech POSSIL. MYDAD & EPECIES PERMETS SESSES Required for PSAR or FSAR MA ND Required for Presperational Test: ALR ASCRITECTURAL DUFFEST COMOC II Yes, Yest No. WBP 330826 539 Vonder Backcharess Involved Scismic Analysis Required Nonconformance Report Required ANSICAL WORK MUST SE DONE BEFORE: Pre-Op Ist Fuel ISTREM Commit 1st Yest Loss Power Oper'n Refue **CA Applies** Security Sy-tem Meditied United ) & 2 MANA Acutaca(8) iunapaca;

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# ENGINEERING CHANGE NOTICE COVER SHEET SWP 83 0214 564

(BEFORE ISSUANCE OF OPERATING LICENSE)

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|          | · · · · · · · · · · · · · · · · · · ·                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | -                                             | <b>_</b>                                         | <del> </del>   | <del> </del> |                              |
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|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | -                                             | <del>                                     </del> |                | <del>}</del> | <del> </del>                 |
|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | _                                             | <del> </del>                                     | <u> </u>       | <u> </u>     | <del> </del>                 |
|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <u> </u>                                      | <del> </del>                                     | <u> </u>       |              | <del> </del>                 |
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## DIVISION OF ENGINEERING DESIGN NONCONFORMANCE REPORT

MEDS Accession No. SWT '82 1221 019

| SHEE       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                |                            |                                         |
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|            | ATTS BAR HUCLEAR PLANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                |                            |                                         |
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|            | I OF CONDITION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                |                            |                                         |
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| , 1        | 7101, F102, F103, F104, F105,<br>7117, F123, F124, F127, F130,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | , FI31, FI41, FOO.                             | 2, 1003, 1004, 1005,       |                                         |
|            | Approximately 24 drawings hav                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | re been identifie                              | d with minor discrepa      | incies.                                 |
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|            | CURRENCE EST ( X), ACT. ( ) 1978                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <u> </u>                                       | FICANT CONDITION ADVERSE T | TO QUALITY                              |
|            | DISCOVERY Third Party Review                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 10 ·BRAN                                       | CH CHIEF/DATE SIIC         | 12/21/82                                |
| 10 COOE (  | EN 065-67 8.01)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                | - marchen                  | <u> </u>                                |
| 3          | ACTION:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                |                            |                                         |
| CORRECTIVE | s programme.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ,                                              |                            |                                         |
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|            | E ACTION DEVIATES SOOM A DESIGN COIL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | I BAIN ME (IN) MEMERY                          | YES NO L                   | <u> </u>                                |
|            | E ACTION DEVIATES FROM A DESIGN CRIT<br>TERIA DOCUMENT NO.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | I ERIA RECUIREMENT                             | EXCEPTION REQUEST NO       |                                         |
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| er JAN 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0 <b>1983</b>                     |            |           | <del></del>                |               |               | -                    |                                                    |            | France Project Manage               | <b>V</b>                              |
| ering Section                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                   |            | H         |                            | MON           | Accession No. |                      |                                                    |            | HU ACCIONAL                         |                                       |
| <u> </u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                   |            | -6        | SWP                        | <b>'8</b> 3   | 0120          | 5                    | 25                                                 | 4          |                                     |                                       |
| CHARLES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | C. FISH                           | ER         | _E        | والمراجع والمراجع والمراجع |               | A A A A A A   |                      | 1. 1.                                              |            |                                     |                                       |
| l Pages (RO):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | RL                                | ونفرهم     | _[]       | SWP                        | 75            | 0214          | 5                    | 44                                                 | S          |                                     |                                       |
| ton<br>ervisor:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | WAST.                             | 200        |           |                            |               |               |                      | <u> </u>                                           | R          |                                     |                                       |
| f Eng. or                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | I/A                               |            | 2         | SWr                        | <b>3</b> 3    | 0308          | 5                    | 22                                                 | 6          |                                     |                                       |
| + 0 /                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | F/2                               | Alu.       |           | \$ 1 0 m m m ( ) m         |               |               |                      |                                                    | R          |                                     |                                       |
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| ject WAT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | TS BA                             | R NUK      | LE        | AR_                        | <u>Pl</u> ån: |               |                      |                                                    |            | Affected Units 12 E                 | · · · · · · · · · · · · · · · · · · · |
| tem or Feeture                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | (3)                               | AU         | XIL.      | IARY                       | EEL           | DWATER        | S                    | YS.                                                | Œ          | <u> </u>                            |                                       |
| A Pare                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <del>المعدد.</del><br>الم معاددات |            |           | ORRE                       |               | DRAWING       |                      |                                                    |            |                                     |                                       |
| erence & Desci                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | rapaten er C<br>CO#               |            | لمك       | SEC.                       |               |               |                      |                                                    |            | COS                                 |                                       |
| INDINGS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                   | FR         | 03:       |                            | FBO           | A . See . I   | Ш.                   | , Ell                                              | 5;         | ###; FU7; F127; F13                 | <u>. رق</u>                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                   |            |           |                            | ,             | , ,           | -                    | •                                                  | •          | •                                   |                                       |
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| ]4].                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                   |            |           |                            |               | ONE AU        | G 25                 | 3 98                                               | 3          |                                     |                                       |
| 141                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                   |            |           | \$EE.                      | ASSOCIA       | DATE AN       | G 25                 |                                                    |            | RSE SIDE                            |                                       |
| DATE P                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | OE- SECT.                         | anoue      |           | H ECN                      | 0.6.          | DVIE VA       | G 25                 | 57, AI                                             | <b>E∨€</b> | RSE SIDE DN OF REVISION             |                                       |
| OATE PI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | RE- SECT.                         | GROUP      | CHIE      |                            | O.P.<br>MGR.  | DATE AU       | G 26                 | ST, AI                                             | EVE        | on of revision                      |                                       |
| DATE PA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | RE- SECT. REO SUPV.               | GROUP      | CHIEF N/A | H ECN                      | O.P.<br>MGR.  | DELETED       | G 25                 | ST, RI                                             | EVE        |                                     | PA                                    |
| DATE PA 155UED PA 2-19-83 R                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | RE- SECT. REO SUPV.               | 92         | CHIEF M/R | H ECN                      | O.P.<br>MGR.  | DELETED       | G 25                 | ST, AI                                             | EVE        | on of revision                      | PA                                    |
| DATE PA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | RE- SECT. REO SUPV.               | arous made | CHIEF N/A | H ECN                      | O.P.<br>MGR.  | DELETED       | G 25                 | ST, RI                                             | EVE        | ADDS D S DW65                       | PA                                    |
| DATE PA 155UED PA 2-19-83 R                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | RE- SECT. REO SUPV.               | 92         | CHIE!     | H ECN                      | O.P.<br>MGR.  | DELETED       | G 25                 | ST, RI                                             | EVE        | ADDS D S DW65                       | PA                                    |
| DATE PA 155UED PA 2-19-83 R                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | RE- SECT. REO SUPV.               | 92         | CHIEF N/A | H ECN                      | O.P.<br>MGR.  | DELETED       | G 25                 | ST, RI                                             | EVE        | ADDS D S DW65                       | PA                                    |
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| DATE 155UED 14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | RE- SECT. REO SUPV.               | 92         | CHIEF M/R | H ECN                      | O.P.<br>MGR.  | DELETED       | G 25                 | ST, RI                                             | EVE        | ADDS D S DW65                       | PA                                    |
| 2-14-83 C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | REO SULTV.                        | MAAO<br>A  | N/A       | HH                         | O.P.<br>MGR.  | DELETED       | G 25                 | ST, RI                                             | EVE        | ADDS D S DW65                       | 70 100                                |

## ENGINEERING CHANGE NOTICE NO. 3650 DATA SHEET NO. \_\_\_\_\_

mec [2]

| AFFECTED  | DEVINE OF PM HUMBER                     | aws<br>Rev.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | thi<br>EXPORT | 74<br>19 | AGTUAL   |          | AGNAAMS          | PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE AND THE PATE |
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|           | 45NA00-3-3                              | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |               | -        | 3-7-83   |          | PSAR FIE. QSI. H | 7-3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 122       | 45N600-3-4                              | 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |          | V        |          | PAR FIG. GU. H   | 7-4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|           | 43W400-37-24                            | T                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |               |          |          |          | DELETE           | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 122       | 45W751-4                                | 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |          | 2-9-83   |          |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 122       | 45W751-10                               | 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |          | 2-9-83   |          |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 122       | 45W760-3                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |          |          |          | DELETE           | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 18.4      | -45W740=3                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |          |          |          | DELETE           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|           | 4581767-2A                              | 17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |          | 2-9-83   |          |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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|           | 45W1767-4                               | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |          | 2-9-83   |          |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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| 1.        | 45W1769-5                               | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |               |          | 2-9-83   |          |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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| 122       | 45W 760-3-4                             | 17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |          |          | <u> </u> |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 162       | 45W760-3-3                              | 17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |          |          |          |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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| //. Revisions | by this a     | section w     | ill require addi           | tional mate           | rials as list    | ed below     |
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| Item          | Unit 1<br>Qty | Unit 2<br>Qty | Procured By (EN DES/CONST) | PR, Reqn.<br>or Contr | Delivery<br>Date | Remarks      |
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Section Supervisor

## ENGINEERING CHANGE NOTICE COVER SHEET SW: 82 1129 506

(BEFORE ISSUANCE OF OPERATING LICENSE)

| TENNESSEE VALLEY AUTHORITY<br>DIVISION OF ENGINEERING DESIGN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1                           | ECH NO.                                             | _200      |
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| Te: Construction Project Manager                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Wate for Nuclear Flast      | Soring City, IN                                     |           |
| From: Design Project Monager                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | SWP 204 GR-K                | 830210F0                                            | 1138      |
| DATE NOV 4 9 1982                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             | 9111                                                | 221       |
| DATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <del>-1</del>               | May refere                                          |           |
| Was IJ Analysis Required: Yes _                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | No_ <u>/</u> _              |                                                     |           |
| D.K. FLOURNOY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | SWP BLE                     | CT.#3 F.F. GEN                                      | CAY 1/2/  |
| or or College                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | •                           | SCIC Section                                        | 1/26/     |
| Project Engineer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Released:                   | Design Project Manager                              |           |
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| Project WATTS AAR NUCL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | AL PLANT                    | Affected Unit(s)                                    | 1+2       |
| System or Festure MAIN CONTROL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | DOCUMENTATI                 | ON CHANCE ONLY HO MAT                               | EDIALC    |
| Reference & Description of Change                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             | TO THE OTHER DISTRICT                               | LNINES    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | OK COM21 CK                 | IF I MAN-HOURS REQUIRED                             |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                             |                                                     |           |
| DRAWINGS OR BANGLINVOLVED:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Yes Cate Branch             | GRENOCEDIOS SUPPORT DEMOCRES                        | Year      |
| Sheet College                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Sheet                       | Approvel Required                                   |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                             |                                                     | _Na       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                             | ECN is ready for branch review:                     |           |
| and the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of t | AVO                         | Design Project Manager                              | Ceti      |
| BARTHEN JAN 31 1988                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                             | Approved:                                           |           |
| Mechanical                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | NO                          | Approved                                            |           |
| Nuclear                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | No                          | CO CIVIL DC. COILEY                                 | Detr      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                             |                                                     |           |
| CIVII                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <u>No</u>                   | and algerment on, and                               |           |
| Electrical 63 00/7.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Y83</b>                  |                                                     | Con       |
| Mech                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | No                          |                                                     |           |
| •                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | SWP                         | thief Nuclear Engineer                              | Det       |
| POSSIL, 87000 & SPECIAL PROJECTS SERIOS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 2ML                         |                                                     | Yes or Ne |
| SPECIAL SESION PROJECTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Ne                          | Required for PSAR or PSAR                           |           |
| ARCHITECTURAL SUPPORT PRANCE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | NO                          | Required for Preoperational Test:  If Yes, Test No. | AME       |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             | Vendor Backcharges Involved                         | Ne        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | _                           | Seismic Analysis Required                           | Ala       |
| PAYRICAL WORK MUST BE DONE BEFORE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             | Nonconformence Report Required                      | A O       |
| Fre-Op 1st Fuel 1957ram<br>Test Lead Power                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Comm'i 1st<br>Oper'n Refuel | QA Applies                                          |           |
| United 1 # Sph                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                             | Security System Medified                            |           |
| United 2.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                             | Vender(s) involved:MOME                             |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                             |                                                     |           |

# ENGINEERING CHANGE NOTICE COVER SHEET WAS 1102 518

| Tennessee valley authority<br>Division of Engineering Desk | /<br>3N<br>Watte Rar Muclear | Plant, Spring City, TRON No. 43         | 58        |
|------------------------------------------------------------|------------------------------|-----------------------------------------|-----------|
| TC: Construction Project Manager                           | WEP 204 GB-K                 | 84030380701                             | (12)      |
| From: NPD Project Meneger                                  |                              | 040000007                               |           |
| DATE 10-31-83                                              | - 1                          |                                         |           |
| Was IJ Analysis Required: Yes                              | No_X                         |                                         | -00       |
| 7. M. Barker Propered by                                   |                              | tion Section L                          | adar .    |
| 9. D. Colles                                               | Released:                    | (NPO Project Missey                     | 1 83.     |
| Project Engineer                                           |                              | ()                                      |           |
|                                                            | <u>so</u>                    | OPE V                                   |           |
| Project WATTS AAR N                                        | Р                            | Affected Units                          | 102       |
| System or Feature SYSTEMS                                  |                              |                                         |           |
| System or realting Statement                               |                              | ALLOS PRINCE CATERARY                   | 124       |
| Reference & Description of Change                          | TASK FORCE EX                | PANDED REYIEW CATEGORY                  |           |
| DRAWING ERRORS.                                            | Black and Yesten             | 1                                       | ·····     |
| Poc                                                        | UMENTATION                   | CHANGE ONLY                             |           |
|                                                            |                              | STRUCTION CRAFT MANHOU                  | es requir |
|                                                            |                              |                                         |           |
| DRAWINGS OR B/M'S INVOLVED                                 | Yes Date or Data Sheet       | SUPPORT BRANCHES APPROVAL REQUIRED      | Yes or No |
| (Data Sheets Required)                                     | No Available                 |                                         |           |
|                                                            | ,                            | ECN is ready for support branch review: |           |
| CIVIL ENGR SUPPORT BRANCH                                  | <u>No</u>                    |                                         | 0.44      |
| ELEC ENGR SUPPORT BRANCH                                   | <u>NO</u>                    | NPD Project Manager                     | Dete      |
| MECH ENGR SUPPORT BRANCH                                   | <u> </u>                     | Approved:                               |           |
| NUCLEAR ENGR SUPPORT BRAN                                  | ICH NO                       |                                         |           |
| ARCH. SUPPORT BRANCH                                       | NO                           | Civil Support Br. Chief                 | Date      |
|                                                            |                              | The State Connect Sec Chief             | Date      |
| SPECIAL DESIGN PROJECTS                                    | OUPS AM NA                   | Electrical Support Br. Chief            |           |
| NUCLEAR PROJECTS DESIGN GF                                 | .00.0                        | Mechanical Support Br. Chief            | Date      |
| Civil                                                      | <u>wo</u>                    |                                         | 0         |
| Electrical                                                 | 765 ~                        | - Chief Nuclear Engineer                | Date      |
| Mechanical                                                 |                              | Arch, Support Br. Chief                 | Date      |
|                                                            |                              |                                         |           |
| PHYSICAL WORK MUST BE DONE                                 | W Y                          |                                         |           |
| NA THE LOS                                                 |                              | and the second                          | Yes or No |
| Unit(s)                                                    | 7.7.31                       | Medical of the section of the section   | <u>NO</u> |
| Unit(s)                                                    | 1                            | Required for Preoperational Test:       | NO        |
|                                                            |                              | If Yes, Test No.                        | .45       |
| 852                                                        |                              | Vendor Backcharges Involved             |           |
| <b>\</b>                                                   |                              | Seismic Analysis Required               | <u></u>   |
| ,                                                          | 0.0                          | Nonconformance Report Required          | MQ_       |
| `                                                          | <b>.</b> "                   | QA Applies                              | Y         |
|                                                            | E . 0                        | Security System Modified                | <u> </u>  |
| WBP 040123                                                 | 568                          | Human Factor Review Required            | NO NO     |
| HUI O                                                      |                              | Pipe Rupture Analysis Required          | <u></u>   |
|                                                            |                              | Vendor(s) involved:                     |           |

| IVIS        | ION OF E               | IGINEE              |          | esign<br>Vatts | Bar N          | luclea       |                        | ING CHANGE<br>DATA SHEET<br>Int, Spring ( | ' NO/       |          | -<br>-      |                                       | <b>~</b>                               | ORA                                   | PAGE 1         |
|-------------|------------------------|---------------------|----------|----------------|----------------|--------------|------------------------|-------------------------------------------|-------------|----------|-------------|---------------------------------------|----------------------------------------|---------------------------------------|----------------|
| From        | n: NPD Pr              | oject Me<br>اد کی ا |          | VEP Z          | :04 GE         | 1-K          | •                      |                                           | ^           | olumno:  | 9y:         | 9.1                                   | 70 m                                   | PC SAN                                | <u>*</u>       |
|             | ng Section             |                     |          |                | 11             |              | M                      | DS Accession No.                          |             | -        | 1           | Mi                                    | DE Acci                                | esion No.                             |                |
| 4           | IBC E                  |                     | TR 10.   | AL P.          | 2 1            | •            |                        |                                           |             | , A      |             | 3                                     |                                        |                                       |                |
|             | red<br>T. M.           | Bar                 | Sen      | 10-25<br>Oct   | 23 0           | WBP          | 8.                     | 31102                                     | 519         | <u> </u> |             |                                       |                                        |                                       |                |
| ota         | Pages (RO              |                     |          |                |                | WB           | <b>o</b> '}            | 340105                                    | 50          | 2        |             |                                       |                                        |                                       |                |
| octi<br>upe | on<br>rvisor: <u>(</u> | lace                | 002      | on             |                |              | •                      |                                           |             | 긕.       | +-          |                                       |                                        |                                       |                |
| teff        | Eng. or iteet:         | NA                  |          | 7              | 2              | WBP          | <b>'84</b>             | 0112                                      | 511         | ·        |             |                                       |                                        | . •                                   | •              |
| rou         | 9.6                    | 9. U                | Un       | ,              | R <sub>3</sub> |              |                        |                                           |             | F<br>7   |             |                                       | -                                      |                                       |                |
|             | hief/<br>Mgr.:         | _                   |          |                |                |              |                        |                                           |             | 1        | 1           | <del></del>                           | <del></del>                            |                                       |                |
|             | et W                   | 477                 | < A      | 40 1           | v P            |              | <del></del>            | SCOPE                                     |             |          |             | Affected                              | Units                                  | 14                                    | <br>2          |
|             | em or Feet             |                     |          |                |                | 72           | 74                     |                                           |             |          |             |                                       |                                        |                                       |                |
|             |                        |                     |          |                |                |              |                        |                                           |             |          |             | 40 -                                  |                                        |                                       |                |
| 1811        | irence & De            | HECTIP TIO          | n of Cha | ~~ <u></u>     | IINO           | C DX         |                        | NG CORP                                   | RET/        | -11. A   |             |                                       | I A CL                                 |                                       | <i>31</i> 1    |
|             |                        |                     |          |                |                |              |                        |                                           |             |          |             |                                       |                                        |                                       |                |
| C           | HANC                   | . 65                | ON       | LY.            | NO             | <u>M A 7</u> | TER!                   | ALS DR                                    | CONS        | IR       | UCT         | CON                                   | RAL                                    |                                       | <u> Margus</u> |
|             |                        |                     |          |                |                |              |                        | ALS OR                                    | 4           | TR       | UCT         | ZON I                                 | <u>ZRAZ</u>                            | -/_A                                  | ANNOUN         |
|             |                        |                     |          |                |                |              |                        | ALS OR<br>FINDING                         | 4           | TR       | UGT         | ZON I                                 | - RAZ                                  | \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | A MOUK         |
|             |                        |                     |          |                |                |              |                        |                                           | 4           | TR       | VGT         | ZON I                                 | z K A F                                | )                                     | THE COL        |
|             |                        |                     |          |                |                |              |                        |                                           | 4           |          | VET         | VON (                                 | ************************************** | )                                     | AN HOUS.       |
|             |                        |                     |          |                |                |              |                        |                                           | •           |          | VET         | ·                                     |                                        | )                                     |                |
|             |                        |                     |          |                |                |              |                        |                                           | •           |          | <i>VGT</i>  |                                       |                                        |                                       |                |
|             |                        |                     |          |                |                |              |                        |                                           | ·\$.        |          | <i></i>     | · · · · · · · · · · · · · · · · · · · |                                        |                                       |                |
|             |                        |                     |          |                |                |              |                        |                                           | ·\$.        |          | VET         | I QN S                                |                                        |                                       |                |
|             |                        |                     |          |                |                |              |                        |                                           | ·\$.        |          | <i>V</i> 67 | I AN .                                |                                        |                                       |                |
|             |                        |                     |          |                |                |              |                        |                                           | ·\$.        |          | VET         |                                       |                                        |                                       |                |
|             |                        |                     |          |                |                |              |                        |                                           | ·\$.        |          | VET         |                                       |                                        |                                       |                |
|             |                        |                     |          |                |                | У 3          | * *                    |                                           | .s.         |          |             |                                       |                                        |                                       |                |
|             | DATE                   | PRE                 | SECT     | GROUP          | BRANCH         | SE ECN       | & 4<br>E ASSO          | PINDING                                   | GS EIST, RE | EVERS    | SE SIDE     |                                       |                                        |                                       | TOT            |
| R           | DATE                   | PRE-PAREO           | SECT     | GROUP          | S & O &        | SE ECN CLERK | E ASSO<br>D.P.<br>MGR. | CIATED DRAWING                            | GS EIST, RE | EVERS    | SE SIDE     |                                       |                                        |                                       | Ton            |
| REV.        | DATE                   | PRE-PAREO           | SECT     | GROUP          | BRANCH         | SE ECN       | E ASSO<br>DP.<br>MGR.  | PINDING                                   | GS EIST, RE | EVERS    | SE SIDE     |                                       |                                        |                                       | TOT            |
| R IEV.      | DATE ISSUED            | PRE-PAREO           | SECT     | GROUP<br>HEAD  | BRANCH         | SE ECN CLERK | E ASSO<br>DP.<br>MGR.  | CIATED DRAWING                            | GS EIST, RE | EVERS    | SE SIDE     |                                       |                                        |                                       | TOT PAG        |
| R<br>IEV.   | DATE ISSUED            | PRE-PAREO           | SECT     | GROUP<br>HEAD  | BRANCH         | SE ECN CLERK | E ASSO<br>DP.<br>MGR.  | CIATED DRAWING                            | GS EIST, RE | EVERS    | SE SIDE     |                                       |                                        |                                       | TOT PAG        |
| R<br>IEV.   | DATE ISSUED            | PRE-PAREO           | SECT     | GROUP<br>HEAD  | BRANCH         | SE ECN CLERK | E ASSO<br>DP.<br>MGR.  | CIATED DRAWING                            | GS EIST, RE | EVERS    | SE SIDE     |                                       |                                        |                                       | TOT PAG        |
| R IEV.      | DATE ISSUED            | PRE-PAREO           | SECT     | GROUP<br>HEAD  | BRANCH         | SE ECN CLERK | E ASSO<br>DP.<br>MGR.  | CIATED DRAWING                            | GS EIST, RE | EVERS    | SE SIDE     |                                       |                                        |                                       | TOT PAG        |
| R<br>IEV.   | DATE ISSUED            | PRE-PAREO           | SECT     | GROUP<br>HEAD  | BRANCH         | SE ECN CLERK | E ASSO<br>DP.<br>MGR.  | CIATED DRAWING                            | GS EIST, RE | EVERS    | SE SIDE     |                                       |                                        |                                       | TOT PAG        |

NO PR REQUIRED

TVA 10575A (EN DES-2-83)

TERMESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN.

## ENGINEERING CHANGE NOTICE NO. <u>4358</u> DATA SHEET NO. <u>1</u>

| ~~ | [2] |
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|    |     |

| APPECTED<br>UNIT | DRAWING OR S/M NUMBER | DWG<br>REV. | EXPECTED   | DATE     |        | FINDING # DATA P    |              |
|------------------|-----------------------|-------------|------------|----------|--------|---------------------|--------------|
| 182              | 45W749-1              | 16          | 1-6-84     | 12-17-83 | 70-13  | `                   | 4-           |
|                  | -2                    | 16          |            | 12-12-43 | 70-67  |                     | +            |
|                  | 45W751-3              | 12          |            | 11.3083  | 72-13  |                     | 1            |
|                  | - 9                   | 14          |            |          | 72-14  | 79-//               | 1            |
|                  | -11                   | 12          |            | 1 1 1    | , ,    | 70-14               | 1            |
|                  | -/2                   | Ш           |            | 1        | 70-23  |                     | 1            |
|                  | 45N600-57-23          | 3           | ''         | 1.5.84   | 74-28  |                     | 1            |
|                  | 45w760-70-1           | 8           | للا        |          |        | 70-7, 70-47,70-64   | 1            |
|                  | -2                    | 9           |            | 4        | 70-65  |                     | 1            |
|                  | -5                    | Ь           | Щ          | 4        | 1      | , 70-24             | 1            |
|                  | -6                    | 9           | سل         | 1        |        | ,70-26              | $\perp$      |
|                  | -7                    | 7           | اللا       | 1        | ,      | 70-56               | 1            |
|                  | -8                    | 9           | 4          | 1        | , ,    | 9,10,11,15,20,44    | 4            |
| H                | -9                    | 6           | 4          | 4        | 70-30  | +                   | 1            |
|                  | -10                   | 8           | 4          | 1        |        | ,70-38,70-46        | 1            |
|                  | 45W760-72-1           | 8           | Щ <u>_</u> | 1.3.84   | ] '    | 11, 20, 25, 41      | . ~          |
|                  | -2                    | 9           | 4          | 1        | 1 -1   | 2,3,4               | +            |
|                  | -3                    | 10          |            | 14       | 72-5   | 6,7,8               | $\perp$      |
|                  | -4.                   | 11          | <u> </u>   | 1.3-84   |        | 24, 26, 27, 32, 3   | <b>3</b>     |
| الملا            | 45W760-74-1           | 7           | 4          | 14-8-83  | 74-10  | 2,3,4,5,14,150      |              |
| س                | -2                    | 13          | 4          | 12-12-83 | 72-19, | 74-6, 7, 8, 10,12,2 | 1            |
| لسليسا           | - 3                   | 9           | لللة       | 12-8-83  | 74-27  | 74-32               | +            |
|                  | -4                    | 10          | <u> </u>   | 12-8-83  |        | 20, 22,31           | 1            |
|                  | 45B1766 - 2C          | 6           |            | 12:22-13 | •      | ,                   | 1            |
|                  | -58                   | 6           | Ш_         | 1        | 74-21  |                     | 1            |
|                  | -100                  | 12          |            | nus      |        | 1                   | 1            |
|                  | -14D                  | 9           | <b>Ш</b>   | · 1      | 74-30  | T                   | 1            |
|                  | 4581768-14E           | 6           | Щ          | Τ.       | 72-15  |                     | 1            |
|                  | - 58                  | 7           | Щ          | Τ.       | 74-24  |                     | 4            |
|                  | 45B1769-12D           | 10          |            |          | 70-36  |                     | $\downarrow$ |
|                  | -14E                  | 1           |            | 12.2843  | 70-31  |                     | 1            |
| <u> </u>         | -15A                  | 1           |            | 4        | 70-55  |                     | 1            |
| 2                | 4582766-5B            | 6           | Ш          | 12.2283  |        | Ĭ                   | _            |
|                  | -10D                  | 10          | Ш          | 1        | 74-19  |                     | $\int$       |
|                  | 4582768-14E           |             |            |          | 72-15  |                     |              |
| <b>V</b>         | - 5B                  | 6           | 1          | ع.دد     | 74-24  |                     | T            |

TVA 10675E (EN DES-7-79)

### ENGINEERING CHANGE NOTICE NO. 4358

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

DATA SHEET NO.

PAGE 3

|          |                       |                                                  | 15                                               |             | DATE         |                                                  | ***                                                                | LINE UPDAT  | rED     |
|----------|-----------------------|--------------------------------------------------|--------------------------------------------------|-------------|--------------|--------------------------------------------------|--------------------------------------------------------------------|-------------|---------|
| ECTED!   | DRAWING OR S/M NUMBER | REV.                                             | EXPECT                                           |             | ACTUAL       |                                                  | /// 6 <sub>4</sub> <del>                                    </del> | REV. NO.    |         |
| 1        | 45W1748-2             | 12                                               | 1-6-                                             | 20          | 12:2013      | 70-50                                            | ·                                                                  |             |         |
|          | 45W1766-3             |                                                  |                                                  |             |              | 79-23                                            | DELE                                                               | TE          | 1       |
|          | 45W1767-2             | 8                                                |                                                  |             | 1.3.84       | 70-43                                            |                                                                    |             |         |
|          | -5                    | 9                                                |                                                  |             | 12-22-13     | 70-52                                            |                                                                    |             | T       |
|          | 45W1768-1             | 10                                               |                                                  |             | 1-3-84       | 74-23                                            |                                                                    |             | Π       |
|          |                       |                                                  |                                                  |             |              | 74=+7                                            | DELET                                                              | 2           | 1,      |
|          | 45W1769-5             | 7                                                |                                                  |             | 1.3.84       | 70075                                            |                                                                    |             |         |
|          |                       | 9                                                | Į                                                | ,           | 12 20:83     |                                                  |                                                                    |             | T       |
|          | 45W2748-4             | 10                                               |                                                  |             | 1-19-84      |                                                  |                                                                    |             | 2       |
| 1-2      | 45W760-70-8           | 10                                               | 1737                                             | <del></del> | 1-17-17      | 70-20                                            |                                                                    |             | -       |
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TVA 10675E (EN DES-7-79) ENGINEERING CHANGE NOTICE NO. TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN DATA SHEET NO.\_\_\_ ISSUE DATE PPECTED UNIT DWG REV. EXPECTED ACTUAL REMARKS DRAWING OR B/M NUMBER

| WATTS BAR                                                                    | NUCLEAR                                   | PLANT                                                                         | •                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | •                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | EC: 10. 4358                                                                         |                                                                                                               |  |  |  |  |  |  |
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| BUILDING AZZ                                                                 | <u>-</u>                                  |                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                      |                                                                                                               |  |  |  |  |  |  |
| SYSTEM/FEATUR                                                                | ≛: <u>70, 7</u>                           | 2,74                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                      |                                                                                                               |  |  |  |  |  |  |
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| Icem                                                                         | Unit 1<br>Qty                             | Unit 2<br>Qty                                                                 | Procured By<br>(EN DES/CONST)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | PR, Requ,<br>or Contr                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Requested<br>Delivery<br>Date                                                        | Remarks                                                                                                       |  |  |  |  |  |  |
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|                                                                              | SYSTEM/FEATUR  Revisions  Revisions  Item | SYSTEM/FEATURE: 20,7  Revisions by this s  // Revisions by this s  Unit 1 Qty | SYSTEM/FEATURE: 20, 72, 74  Revisions by this section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section with the section wit | SYSTEM/FEATURE: 20, 72, 74  The Revisions by this section will not require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will require additional section will be added to the section will require additional section will require additional section will require additional section wil | SYSTEM/FEATURE: 20, 72, 74     Revisions by this section will not require additional | SYSTEM/FEATURE: 20, 72, 74  Revisions by this section will not require additional materials as list    Unit 1 |  |  |  |  |  |  |

T.M. Baveer Preparer

Section Supervisor

|      |                  |               |        |          |           |                   |              | ant intinv       |               |                |                    |               |            |          |
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| To:  |                  |               |        |          |           |                   | F16          | ant, opins       | City, IN      |                |                    |               |            | PAGE 1   |
|      | m: NPD P         |               |        | WCP .    | 204 6     | 8-N               |              |                  | Reli          | mand D         | <i>- چ</i>         | . <i>B</i> .  | Cra        | <u> </u> |
| Code | •: <u>/</u>      | 7-2           | · X3   |          |           |                   |              |                  |               |                |                    | 1000          | rejest men |          |
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Additional Information: NoNe

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN-

### ENGINEERING CHANGE NOTICE NO. 4358 DATA SHEET NO. 2

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| AFFECTED      | DRAWING OR S/M NUMBER  | DWG<br>REV.                                      | ISSUE<br>EXPECTED | ACTUAL                                           |          | REMARKS                                          | DIO DATA SHEET             |
|---------------|------------------------|--------------------------------------------------|-------------------|--------------------------------------------------|----------|--------------------------------------------------|----------------------------|
| 1+2           | 47 W 6/1 - 70 - 3      | 4                                                | 1-16-54           | 1-9-84                                           | -        | MA-70-2, - 16,-                                  |                            |
|               | 474611-70-1            | 6                                                | 123               |                                                  |          | WA-70-7                                          | 1/                         |
|               | 47W610-70-3            | 6                                                | 1-16-34           |                                                  |          | w6-70-85 ,-1                                     | + 449                      |
|               | 47W610-72-1            | //                                               | 12 57 6           | 4                                                |          | WB-72-9                                          | . 1                        |
|               | 47w611-72-1            | 10                                               | 12-26             | 1                                                |          | WB-72-9                                          |                            |
| <u> </u>      | 478601-72-Series       | 13                                               | 12-26-83          | 12.15.83                                         |          | WB-72-9                                          | نم د                       |
|               | 47W6H-74-1             |                                                  | 12-26-83          |                                                  |          | WB 77 7                                          | [A. 4.10.153               |
| -             | 47 4 60 1- 70 Series   |                                                  | 12 81 63          |                                                  |          | ₩ 4-10-47                                        |                            |
| 142           | 47 B 601-72-0 (series) | 14                                               | 1-16-84           | 1-10-19                                          |          |                                                  |                            |
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### SCOPE OF CHANGE ESTIMATE Amelment 1 to Ante Shoret ECH NO. 4358 WATTS BAR NUCLEAR PLANT BUILDING - NA SYSTEM/FEATURE: .Systems' 70,72,74 Revisions by this section will not require additional material [ Revisions by this section will require additional materials as listed below Requested Delivery PR, Reqn, Procured By Unit 1 Unit 2 Remarks (EN DES/CONST) or Contr Date Qty Icem Qty

| TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN | (                             | ING CHANGE NOTICE N<br>DATA SHEET NO | o. <u>435</u><br>—                             | <u>.8</u>    | BRANCH [     |             |
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| Br. Chief/                                                | 3 MRL 9                       | 40110 501                            | [7]                                            |              |              |             |
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| Project WATTS BAR N                                       | . Р.                          |                                      | A                                              | Hected Units | 1            |             |
| System or Feeture SYS 70                                  |                               |                                      |                                                |              |              |             |
| Reference & Description of Change TASK                    |                               | EYOANDED OF                          | VEW C                                          | ATEGORY      | 1 3+4        |             |
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| DRAWING ERRORS.                                           |                               |                                      |                                                |              |              |             |
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| 4 2-1-84 RAH MG 5546                                      | M/ 345/4                      | ADD DWG                              | <u> </u>                                       |              |              | 12          |
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TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN.

### ENGINEERING CHANGE NOTICE NO. 4358 DATA SHEET NO. 3

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| DRAWING OR S/M NUMBER | OWG<br>REV.                                                                                                                                                                                                                                                      | EXPECTED                               | ACTUAL.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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| WATTS BAS   | RNUCLEAR   | Plani                                            |                                                  |                       | ėch no. <u>Y</u>              | 358                                   |
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| BUILDING _  | - AUXIC    | JARY                                             | <u>.</u>                                         |                       | _                             | <del></del>                           |
|             | ATURE: 70, |                                                  |                                                  |                       | -                             |                                       |
|             |            |                                                  | ill not require                                  | additional            | material                      |                                       |
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| Item        | Unit I Qty | Unit 2<br>Qty                                    | Procured By (EN DES/CONST)                       | PR, Reqn,<br>or Contr | Requested<br>Delivery<br>Date | Remarks                               |
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Section Supervisor

## TVA 10879C (EN 085-245) ENGINEERING CHANGE NOTICE COVER SHEETWBP 83 1 1 0 7 5 1 2

(BEFORE ISSUANCE OF OPERATING LICENSE)

| ENNESSEE VALLEY AUTHORITY<br>VISION OF ENGINEERING DESIGN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | •                         |                         | Plant, Spring City, TRCN No. 4                                                                                                                                                                                                                                                        | 360                                                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| TO: Construction Project Manager                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Watts Ba<br>WEP 204       | ar Nuclear              | Plant, Spring City, 14                                                                                                                                                                                                                                                                |                                                              |
| m: NPD Project Manager                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | WEP ZU4                   | - GD-N                  |                                                                                                                                                                                                                                                                                       |                                                              |
| TE 10.31.83                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | _                         | •                       | 01004150331                                                                                                                                                                                                                                                                           |                                                              |
| . I I Amahasia Gamainada — Vos                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | No X                      |                         | 840214F0321                                                                                                                                                                                                                                                                           | (//                                                          |
| s IJ Analysis Required: Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | _ №                       | •                       |                                                                                                                                                                                                                                                                                       | <i>m</i>                                                     |
| Proposed by                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | _ <del>w</del> ø          | P ELEGT                 | RICAL #2 CONCEPT                                                                                                                                                                                                                                                                      | Ladian                                                       |
| 9. O. Collers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Releas                    | ed:                     | 30 Start & 1/7/8                                                                                                                                                                                                                                                                      | r3                                                           |
| Project Engineer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                           |                         | APO Project Manager                                                                                                                                                                                                                                                                   | Date                                                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                           | sco                     | <u>566</u> (07) 3 ()                                                                                                                                                                                                                                                                  |                                                              |
| oject <u>watts bar n.</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <u>P</u>                  |                         | Affected Unit                                                                                                                                                                                                                                                                         | (s)                                                          |
| stern or Feeture <u>SYSTEM</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | •                         | •                       |                                                                                                                                                                                                                                                                                       |                                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                           |                         | XPANDED REVIEW CATE                                                                                                                                                                                                                                                                   | BORY 2                                                       |
| RAWING ERRORS.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | BIACK                     | and Ve                  | (tch)                                                                                                                                                                                                                                                                                 |                                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                           |                         |                                                                                                                                                                                                                                                                                       |                                                              |
| FR PKG : x-70 (1), (2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ). (4).(                  | 5): x-1                 | 2(1)                                                                                                                                                                                                                                                                                  |                                                              |
| AWINGS OR B/M'S INVOLVÉD:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Yes                       | Date                    | SUPPORT BRANCHES                                                                                                                                                                                                                                                                      | Yes or No                                                    |
| (Data Sheets Required)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | or<br>No                  | Data Sheet<br>Available | APPROVAL REQUIRED                                                                                                                                                                                                                                                                     | NO                                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | No                        | Available               | ECN is ready for support branch review:                                                                                                                                                                                                                                               |                                                              |
| VIL ENGR SUPPORT BRANCH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | NO                        |                         | •                                                                                                                                                                                                                                                                                     |                                                              |
| EC ENGR SUPPORT BRANCH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | NO                        |                         | NPO Project Manager                                                                                                                                                                                                                                                                   | Dete                                                         |
| ECH ENGR SUPPORT BRANCH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <u>NO</u>                 |                         | Approved:                                                                                                                                                                                                                                                                             |                                                              |
| ICLEAR ENGR SUPPORT BRANCH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | H NO                      |                         |                                                                                                                                                                                                                                                                                       |                                                              |
| RCH. SUPPORT BRANCH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | NO                        |                         | Civil Support Br. Chief                                                                                                                                                                                                                                                               | Date                                                         |
| ECIAL DESIGN PROJECTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | NO                        |                         | - Electrical Support Br. Chief                                                                                                                                                                                                                                                        | Date                                                         |
| CLEAR PROJECTS DESIGN GROU                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                           | MA                      |                                                                                                                                                                                                                                                                                       |                                                              |
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| Civil                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | NO                        |                         | Mechanical Support Br. Chief                                                                                                                                                                                                                                                          | Date                                                         |
| Civil<br>Electrical                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | XE?                       |                         | Mechanical Support Br. Chief Chief Nuclear Engineer                                                                                                                                                                                                                                   | Date                                                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                           |                         | Chief Nuclear Engineer                                                                                                                                                                                                                                                                | Date                                                         |
| Electrical<br>Mechanical                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | NO                        |                         |                                                                                                                                                                                                                                                                                       |                                                              |
| Electrical Machanical PHYSICAL WORK MUST BE DONE BEI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | NO                        |                         | Chief Nuclear Engineer                                                                                                                                                                                                                                                                | Date                                                         |
| Electrical<br>Mechanical                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | NO                        |                         | Chief Nuclear Engineer                                                                                                                                                                                                                                                                | Date Date                                                    |
| Electrical Mechanical  PHYSICAL WORK MUST BE DONE BEI Pre-Op 1st Fuel Test Lond                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | NO<br>FORE                |                         | Chief Nuclear Engineer                                                                                                                                                                                                                                                                | Date Date                                                    |
| Electrical Mechanical  PHYSICAL WORK MUST BE DONE BEI Pre-Op 1st Fugl. Test Local  Initial                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | NO.                       |                         | Chief Nucleer Engineer  Arch. Suppost Br. Chief                                                                                                                                                                                                                                       | Date Date Yes or No                                          |
| Electrical Mechanical  PHYSICAL WORK MUST BE DONE BEI Pre-Op 1st Fugl. Test Local Jointal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | NO.                       | 3.84                    | Chief Nucleer Engineer  Arch. Suppost Br. Chief  Required for PSAR or FSAR                                                                                                                                                                                                            | Date Date Yes or No                                          |
| Electrical Mechanical  PHYSICAL WORK MUST BE DONE BEI Pre-Op 1st Fugl. Test Local Jointal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | NO.                       | 33.84                   | Chief Nuclear Engineer  Arch. Suppost Br. Chief  Required for PSAR or FSAR Required for Preoperational Test:                                                                                                                                                                          | Date Date Yes or No NO NO                                    |
| Electrical Mechanical  PHYSICAL WORK MUST BE DONE BEI Pre-Op 1st Fugl. Test Local  Jointal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | NO.                       | 3.84                    | Chief Nucleer Engineer  Arch. Suppost Br. Chief  Required for PSAR or FSAR Required for Preoperational Test:  If Yes, Test No.                                                                                                                                                        | Date  Date  Yes or No. N.O.                                  |
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| Electrical Mechanical  PHYSICAL WORK MUST BE DONE BEI Pre-Op 1st Fugl. Test Local Jointal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | NO.                       | 3.84<br>H 118           | Chief Nucleer Engineer  Arch. Suppost Br. Chief  Required for PSAR or FSAR Required for Preoperational Test:  If Yes, Test No.  Vendor Backcharges Involved Seismic Analysis Required                                                                                                 | Pate  Date  Yet or No NO NO NO NO NO NO NO NO NO NO NO NO NO |
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TERMESSEE VALLEY AUTHORITY DEVISION OF ENGINEERING DESIGN

#### ENGINEERING CHANGE NOTICE NO. <u>#360</u> DATA SHEET NO. \_\_\_\_

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### ENGINEERING CHANGE NOTICE NO. 4360

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

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#### SCOPE OF CHANGE ESTIMATE

| SYSTEH/FEAT                           |               |               | ill not require            | additional            | caterial                      |           |
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| Revision                              | ns by this :  | section v     | ili require addi           | itional mate          | rials as lis                  | ted below |
| Item                                  | Unit 1<br>Qty | Unit 2<br>Qty | Procured By (EN DES/CONST) | PR, Requ,<br>or Contr | Requested<br>Delivery<br>Date | Resarks   |
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| WIRE TAGS                             | AS REQ.       |               | CONST                      |                       |                               |           |
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Section Sufervisor

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|                    |            | Project N<br>11-1 |                |           | 204 (                                 | iB.K         |        |          |             |              |         | Relea    | and By:                               |                                       | r. <i>0</i> | 4          | 100      |        |
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| roject             | _          | dbs               | hr_            | Mes       | ber !                                 | <u>Clant</u> |        |          |             |              |         |          |                                       | AM                                    | eted U      | nits       |          | /      |
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|                    | DATE       |                   | SECT.<br>SUPV. | GROUF     | PRANCH                                | ECN          | O.P.   | DCIA W   | ROMAN       | HNGS         |         |          |                                       | FREVI                                 | BION        |            |          | Too    |
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TVA 10575A (EN DES-2-83)

TEMPOREE VALLEY AUTHORITY DEVICES OF ENGINEERING DESIGN.

#### ENGINEERING CHANGE NOTICE NO. 4360 DATA SHEET NO. \_\_\_\_\_

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| APPECTED    | DRAWING OR S/M NUMBER                 | REV.                                             |          | DATE<br>ACTUAL |                                                  | REMARKS      | DI DATA SHEE |
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TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

### ENGINEERING CHANGE NOTICE NO. 4360 DATA SHEET NO. 3

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| 2            | BUILDING                        |               |               |                            |                       |                               |                                       |
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|              | Revisions                       | by this       | section w     | ill not require            | additional            | material                      |                                       |
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## TVA 10879C (EN DES-240) ENGINEERING CHANGE NOTICE COVER SHEET WBP '84 0 3 1 5 5 1 8

(BEFORE ISSUANCE OF OPERATING LICENSE)

| TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ECN No. 4                                                                                          | 666                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| Arroject Engine:                                          | A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | -NPD Project Manager                                                                               | <b>900</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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| Project WATTS BAR NU                                      | UCLEAR PLANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Affected Ur                                                                                        | 118(18)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| AT I DAM & SCHEN                                          | WATIC DIAGRAS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <u>A COMPATIBLITY , I ASK</u>                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| EXPANDED REVIEW                                           | BLACK AND Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | EATCH). FSAR LOGIC A                                                                               | ND SCHEMATIC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| DRAWINGS REVIEW.                                          | (Category 3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| DRAWINGS OR B/M'S INVOLVED:                               | Yes Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | SUPPORT BRANCHES                                                                                   | Yes or No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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| (Data Sheets Required)                                    | No Available                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ECN is ready to expend to branch review:                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| CIVIL ENGR SUPPORT BRANCH                                 | NO -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | - KW/olking                                                                                        | <u> 3-13-64</u><br>Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| ELEC ENGR SUPPORT BRANCH                                  | <b>10</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | NPD Manager                                                                                        | Care                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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| ARCH. SUPPORT BRANCH                                      | No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | = 2.W. Chandler                                                                                    | 3-14-84                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| SPECIAL DESIGN PROJECTS                                   | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Electrical Support Br. Chief                                                                       | 7-15-84                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| NUCLEAR PROJECTS DESIGN GAC                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Medianical Support Br. Chief                                                                       | Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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| Electrical E1, E2, E3                                     | MO 1.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | N/A                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Mechanical                                                | 133                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Arch. Support Br. Chief                                                                            | Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| PHYSICAL WORK MUST BE DONE B                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Pro-Op 1se Flu                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                    | Yes or No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Unit(s)                                                   | 6702                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Required for PSAR or FSAR                                                                          | NO THE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Unit(s)                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Required for Preoperational Test:  If Yes, Test No                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                           | C8 530                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Vender Backcharges Involved                                                                        | NO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| אורו או סופות של                                          | ווער היי                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                    | MA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| DZ85- WBP '8406                                           | 008 370                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Saismic Analysis Required                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 0205- WBP '8406                                           | 008 370                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Saismic Analysis Required Nonconformance Report Required                                           | NO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| D285-                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Nonconformence Report Required  QA Applies                                                         | YES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| D285-                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Nonconformence Report Required  QA Applies Security System Madified                                | NO.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| DZ85-<br>UNIT 2 ECN 4667                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Nonconformence Report Required  QA Applies  Security System Medified  Human Factor Review Required |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| D285-                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Nonconformence Report Required  QA Applies Security System Madified                                | NO NO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

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|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------|---------------|--------------------------|--------------|------------------------|--------------|-----------------|----------|----------|----------------------------------------|-------------|------|----|
|                     | UPD Proje                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |              | - 10        | 77A           |                          |              |                        |              |                 |          | T        |                                        |             |      | _  |
| m: 1                | 470 Proje                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | st Monag     | # <u>WB</u> | 6.4           |                          |              | _                      |              |                 |          | 7        | A 100                                  | Project III |      |    |
| Ξ                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |              |             |               | 11                       |              | WED                    | Accession N  |                 | $\Box$   |          | WHOLE.                                 |             |      |    |
| M                   | E 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              |             |               | 100                      |              | 10 A                   | Λ z 1 5      | 519             |          |          |                                        |             |      |    |
|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |              |             | 45.14         | 101                      | BP           | 04                     | 0 7 1 7      |                 | _[]      |          |                                        |             |      |    |
|                     | PRLES<br>pm (RO):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |              | SAFE.       |               | 1                        |              |                        | · σ Λ 1      | FAR             |          |          |                                        |             |      |    |
|                     | 77                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | (B)<br>-YD.  | 1           |               | 北江                       | BP '         | <u>84 C</u>            | 501          | 707             | -11      |          |                                        |             |      |    |
| arvis               | "Gili                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>₹777.</b> | fore        | 21101         |                          | m A          | 104                    | 0 = 0 =      |                 |          |          |                                        |             |      | ٠  |
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| 100                 | 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Pal          | 11.         | 4.            | A                        |              |                        |              |                 | 7        |          |                                        |             |      |    |
| d :<br>Chio         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | LAL          | em          | 70-           | -  3                     |              |                        |              |                 |          |          |                                        |             |      |    |
| Mg                  | 7.:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              |             |               |                          |              |                        | scor         |                 |          |          |                                        |             |      | _  |
| سى <u>.</u><br>مىمد | WAT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 75 1         | BAR         | NU            | LEA                      | R            | LAN                    | T            |                 |          | ^        | Hected Uni                             | <b>-</b>    |      |    |
|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1/           | B 21/       | 1116          |                          |              |                        |              |                 |          |          |                                        |             |      |    |
| 20/7                | or Fastur                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ٠            | ממח         | 4.4           |                          |              | 4                      | 47910        | L DRA           | WI L     | AC D     | E TO                                   | RE          | UEW  |    |
| fere                | nce & Des                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | cription (   | of Change   | 10            | KKEC                     |              | ELE                    | CIAIL        | L KAA           |          |          |                                        |             |      |    |
|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |              |             |               |                          |              |                        |              |                 |          |          | TY.                                    |             |      |    |
| 5                   | LOG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 16           | 2           | SCH           | EMA                      | TIC          | <u>_D</u> 1            | AGRAN        | COM             | ZA L     | RILL     |                                        |             |      |    |
| E.                  | LOG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | IC_          | 2           | SCH           | EMA                      | TIC          | DI                     | AGRAN        | COM             | <u> </u> | BILL     |                                        |             |      |    |
| E.                  | LOG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | IC_          | 2           | SCH           | EMA                      | TIC          | _DI                    | AGRAN        | COM             | <u> </u> | AIL.     |                                        |             |      |    |
| E                   | LOG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | IC           | 2           | SCH           | EMA                      | TIC          | DI                     | AGRAN        | COM             |          | RILL.    |                                        |             |      |    |
| E                   | LOG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | IC_          | 2           | SCH           | EMA                      | TIC          | <u> </u>               | AGRAN        |                 |          |          |                                        |             |      |    |
| <u>E</u>            | LOG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | IC           | 2           | SCH           | EMA                      | TIC          | <u></u>                | AGRAN        | COM             |          |          |                                        |             |      |    |
| <i>E</i>            | _L06                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ic           | 2           | SCH           | EMA                      | TIC          |                        | AGRAN        | COM             |          |          |                                        |             |      |    |
| £.                  | _ L06                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |              | 2           | SCH           | EMA                      |              | <u> </u>               | AGRAM        | COM             |          |          | ٠<br>٠                                 |             |      |    |
| £.                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |              | 2           | SCH           | <b>EMA</b>               | TIC          | <u> </u>               | AGRAM        | COM             |          |          |                                        |             |      |    |
|                     | L06                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              | 2           | SCH           | EMA                      | TIC          | <u> </u>               | AGRAN        | COMI            |          |          |                                        |             |      |    |
| <i>E</i>            | L06                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              | 2           | SCH           | EMA                      | TIC          |                        | AGRAN        | シュ<br>シー<br>ME_ |          |          | ٠\٠<br>٠\٠                             |             |      |    |
| £                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |              | 2           | SCH           | EMA                      | TIC          |                        | AGRAN        | COMP            |          |          | \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ |             |      |    |
| £                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |              | 2           | SCH           | EMA                      |              |                        | AGRAN        | LOSURE S        | /<br>H.* |          |                                        | 3-          |      |    |
|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |              | 2           |               | EMA                      |              |                        | AGRAN        | シュ<br>シー<br>ME_ | /<br>H.* |          |                                        |             |      |    |
|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |              |             |               |                          | SI SCN       | EE ASSO                | AGRAN        | LOSURE S        | H. #     | SE SIDE  | EVISION                                |             |      | TO |
|                     | DATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |             |               |                          | SE ECH       | EE ASSO                | B CLATED DRA | LOSURE S        | H. #     | SE SIDE  | EVISION                                |             |      | PA |
|                     | DATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | PARED        | SECT.       |               |                          | SE ECN CLERI | E ASSO<br>OP<br>K MGR. | CIATED DRA   | LOSURE S        | H. #     | SE SIDE  | EVISION                                |             |      |    |
| IV.                 | DATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              | SECT.       | GROUP<br>HEAD | BRANCH                   | SE ECN CLER  | E ASSO<br>OP<br>K MGR. | B CLATED DRA | LOSURE S        | H. #     | SE SIDE  | EVISION                                |             |      | PA |
| IV.                 | DATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | PARED        | SECT.       | GROUP<br>HEAD | BRANCH<br>CHIEF<br>SWC c | SE ECN CLER  | E ASSO<br>OP<br>K MGR. | CIATED DRA   | LOSURE S        | H. #     | SE SIDE  | EVISION                                |             |      | PA |
| IV.                 | DATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | PARED        | SECT.       | GROUP<br>HEAD | BRANCH<br>CHIEF<br>SWC c | SE ECN CLER  | E ASSO<br>OP<br>K MGR. | CIATED DRA   | LOSURE S        | H. #     | SE SIDE  | EVISION                                |             |      | PA |
| IV.                 | DATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | PARED        | SECT.       | GROUP<br>HEAD | BRANCH<br>CHIEF<br>SWC c | SE ECN CLER  | E ASSO<br>OP<br>K MGR. | CIATED DRA   | LOSURE S        | H. #     | SE SIDE  | EVISION                                |             |      | PA |
| IV.                 | DATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | PARED        | SECT.       | GROUP<br>HEAD | BRANCH<br>CHIEF<br>SWC c | SE ECN CLER  | E ASSO<br>OP<br>K MGR. | CIATED DRA   | LOSURE S        | H. #     | SE SIDE  | EVISION                                |             |      | PA |
| F                   | DATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | PARED        | SECT.       | GROUP<br>HEAD | BRANCH<br>CHIEF<br>SWC c | SE ECN CLER  | E ASSO<br>OP<br>K MGR. | CIATED DRA   | LOSURE S        | H. #     | SE SIDE  | EVISION                                |             |      | PA |

TVA 10575A IEN 065-2439

Part of Street

rate as follows:

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN.

### ENGINEERING CHANGE NOTICE NO. 4444.

max [2]

| AFFECTED     | DRAWING OR BAN NUMBER                   | DWG<br>REV.    | EXPECTED                                         | ACTUAL                                           | REMARKS                                          | SE GATA SHEET |
|--------------|-----------------------------------------|----------------|--------------------------------------------------|--------------------------------------------------|--------------------------------------------------|---------------|
|              | 458400 ST &S                            |                | 5-1-84                                           |                                                  | DELETE                                           | \             |
|              | 45W750-10-24                            |                |                                                  |                                                  | DELETE                                           |               |
| <del></del>  | 45w760-30-7                             | 10             |                                                  | 5-1-84                                           |                                                  |               |
|              |                                         | 4              |                                                  | 5-1-84                                           |                                                  |               |
|              | 45N600-30-13                            | 4              |                                                  |                                                  | ADD                                              |               |
|              | 45W175R-3                               | 10             |                                                  | <del>                                     </del> | ADD                                              |               |
| _ <i>L</i> _ | 45W/157-3                               | 12             | <del>                                     </del> | ╀┼┼                                              | ADD                                              |               |
| <b>-</b> 4∤  | 45W757-1                                |                | <del>                                     </del> | <del>                                     </del> | ADD                                              |               |
|              | 45W757-3                                | 4              |                                                  | ┼╨╌┼                                             |                                                  |               |
| 1            | 45W760-62-5                             |                | 5-25-84                                          |                                                  | ADD                                              | •             |
|              | -67-8                                   | 10             | <u> </u>                                         | 1.7                                              | GEA                                              |               |
|              | ·                                       | <u> </u>       | <u> </u>                                         | <del>                                     </del> |                                                  |               |
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|              | <b>†</b>                                | $\neg$         |                                                  |                                                  |                                                  |               |

### SCOPE OF CHANGE ESTIMATE .

|                                         |                |                                                  | ill not require                                  |                                                |                               | ted below   |
|-----------------------------------------|----------------|--------------------------------------------------|--------------------------------------------------|------------------------------------------------|-------------------------------|-------------|
| îcez                                    | Unit 1 Qty     | Unit 2<br>Qry                                    | Procured By (EN DES/CONST)                       | PR, Reqn,<br>or Contr                          | Requested<br>Delivery<br>Date | Remarks     |
| *************************************** |                |                                                  |                                                  |                                                |                               | <del></del> |
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| System             | n or Festu           | ک ه          | <u> </u>     | <b>1</b> | <i>*</i> | 30;          |                      | VARIOU                                                  | <u> </u>          |              |               |          |             |        | _            |
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| A                  | ND S                 | CHE          | AAT          | C D      | QAWII    | yg c         | omE                  | ATIBILI                                                 | TY. I             | ASK P        | ORC           | EEX      | PANL        | EU_A   | EVIE         |
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| A                  | ND S<br>BLAC         | CHE          | AAT          | C D      | QAWII    | YG C<br>FSA  | ome<br>R L           | PATIBILI<br>DGIC ANI                                    | TY. I             | ASK P        | ORC<br>C DR   | E EXI    | REV         | IEW.   | EVIE         |
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| _A                 | ND S                 | CHE          | AAT          | C D      | QAWII    | YG_C<br>FSA  | <i>e lu</i>          | PATIBILI<br>DGIC ANI                                    | TY. I             | ASK P        | DR/           | WING     | REV         | VEW .  | /3//         |
| A                  | ND S                 | CHE          | AAT          | C D      | QAWII    | NG C         | - N                  | PATIBILI<br>PEIC AND                                    | TY. I             | ASK P        | DR/           |          | REV         | VIEW.  | /3//-1       |
| A                  | ND S                 | CHE          | AAT          | C D      | QAWII    | YG C         | - N                  | PATIBILI<br>DEIC ANI                                    | TY. I             | ASK P        | DR/           |          | REV         | YEW .  | /a//a        |
| A                  | ND S                 | CHE          | AAT          | C D      | QAWII    | YG_C<br>FSA  |                      | PATIBILI<br>POSIC AND                                   | TY. I             | ASK P        | DR/           |          | REV         | ZIEW . | /3//-1       |
| A                  | ND S                 | CHE          | AAT          | C D      | QAWII    | FSA          |                      | PATIBILI<br>PEIC AND                                    | TY. T             | ASK F        | DR.           |          | REV         | I EW   | /3//3        |
| A                  | ND S<br>BLAC         | CHEA         | MATI         | EATO     | RAWIII   | FSA.         |                      | PATIBILI<br>POSIC AND                                   | TY. TO SCHE       | ASK F        | E SIDE        |          | REV         | UFW.   |              |
| REV                | BLAC                 | CHEA         | AATI<br>D VI | EATO     | RAWII    | SER BECN     | ASSO D.P.            | PATIBILI<br>PEIC AND                                    | TY. TO SCHE       | ASK F        | E SIDE        |          | REV         | I FW   | TO           |
|                    | BLAC                 | CHEA         | AATI<br>D VI | EATO     | RAWIII   | SE ECN CLERK | ASSOCIATION MGA.     | PATIBILI<br>PEIC AND<br>PATE<br>LOSURES                 | TY. TO SCHE       | ASK F        | E SIDE        | EVISION  |             |        | TO           |
| REV                | BLAC                 | CHEA         | AATI<br>D VI | EATO     | RAWII    | SER BECN     | ASSOCIATION OF MICH. | PATIBILI<br>PAIC AND<br>PAIF<br>CLOSUMES<br>CIATED DRAW | TY. T. SCHE       | REVERS:      | E SIDE        | EVISION  |             |        | TO           |
| PREV               | BLAC                 | CHEA         | AATI<br>D VI | EATO     | RAWIII   | SE ECN CLERK | ASSOCIATION MGA.     | PATIBILI<br>PEIC AND<br>PATE<br>LOSURES                 | TY. T. SCHE       | ASK F        | E SIDE        | EVISION  |             |        | TO           |
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| PREV               | BLAC                 | CHEA         | AATI<br>D VI | EATO     | RAWIII   | SE ECN CLERK | ASSOCIATION OF MICH. | PATIBILI<br>PAIC AND<br>PAIF<br>CLOSUMES<br>CIATED DRAW | TY. T. SCHE       | REVERS:      | E SIDE        | EVISION  |             |        | TO           |
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TEMMESSEE VALLEY AUTHORITY DIVISION OF ENGINEEMING DESIGN

### ENGINEERING CHANGE NOTICE, NO. 4444

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|                                                  |                       | Owe. |          | DATE     | <del></del>  |             | 20010        |
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| UNIT                                             | DRAWING OR S/M NUMBER | REV. | EXPECTED | ACTUAL   | <del></del>  | REMARKS     | MY, NO       |
| - 1                                              | 47W611-26-1           | 10   | 5-1-84   | 5-384    |              |             |              |
|                                                  | 47W411-24-2           | 7    |          | 4        |              |             |              |
|                                                  | 47W6/1-13-6           |      |          |          | = De         | lete        |              |
|                                                  | 47W611-30-1           | 4    |          | 5-384    |              |             |              |
| 1                                                | 47W611-30-3           | 6    |          |          |              | -           |              |
| 1                                                | 47W6/1-30-6           | 13   |          | 1        | <u>`</u>     |             |              |
|                                                  | 47W611-30-7           | 4    |          | 5.7.84   | <u> </u>     |             |              |
|                                                  | 47W610-1-1            | 15   |          | 5-3-84   | AD           | one one     |              |
|                                                  | 47W61-1-1             | 8    |          | 5-384    |              | <u> </u>    |              |
|                                                  | 478601-1-582183       | 26   |          | 5-16-14  |              |             |              |
|                                                  | 47W 610-62-2          | 13   |          | 518.84   | · · · · · ·  |             |              |
|                                                  | 47W611-62-1           | 7    |          | 5-1-84   |              |             |              |
|                                                  | 478601-62-58845       | 23   |          | 510-84   |              |             |              |
|                                                  | 476610-67-3           | 3    |          | V .      |              |             |              |
|                                                  | 47N611-67-3           | 5    |          | 5-10-114 |              |             |              |
|                                                  | 478601-67-SERVES      | 22   |          | 5-16-84  | <u> </u>     | ·           |              |
|                                                  | 47W610-68-5           | 14   |          | V        |              |             |              |
|                                                  | 474611-68-3           | 7    |          | 5-16-84  |              |             | <del>`</del> |
|                                                  | 478601-68-SENES       | 24   |          | 5-4-84   |              |             |              |
|                                                  | 474611-1-3            | 6    |          | 5-344    |              |             |              |
|                                                  | 478611-2-1            | 7    |          | 4.19.84  | <del> </del> |             |              |
|                                                  | 47W611-3-1            | 4    |          | 5.384    |              |             |              |
|                                                  | 47W611-5-1            | ١    |          | 5.184    | <u>l</u>     |             |              |
|                                                  | 476611-6-1            | 7    |          |          |              |             |              |
|                                                  | 47W611-12-1.          | 6    |          | 5.344    |              |             |              |
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|                                                  | 47611-14-1            | 7    |          | 5-1-84   |              |             |              |
|                                                  | 47611-15-1            | 8    |          | 1        |              |             |              |
|                                                  | 471611-18-1           | 4    |          | 4-19-84  |              |             |              |
|                                                  | 47WG11-20-1           | 3    |          | 51-84    |              |             |              |
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### ENGINEERING CHANGE NOTICE NO. 4666

TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

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## SCOPE OF CHANGE ESTIMATE WATTS BAR NUCLEAR PLANT BUILDING VARIOUS SYSTEM/FEATUREI 24,26, 30, 131 REVISIONS BY THIS SECTION WILL RET REGULARE ABENTAGNAL MATERIAL. REVISIONS BY THIS SECTION WILL REQUIRE ADDITIONAL MATERIALD AS LISTED GELOW. ୭ନ, ଅଷ**୍ଟ**ମ, **୦ନ CO**ଖ୩ନ recuested Delivery Date remarks PROCURED BY (EN DES/CONST) 2 71MU 779 I PINU ITEM

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| HESSEE VALLEY AUTHORITY HON OF ENGINEERING DESIGN ENGINEERING CHANGE NOTICE NO. 466                                                                                                                                                 |                 |
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| Watts Bar Nuclear Plant, Spring City, TN                                                                                                                                                                                            | PAGE []         |
| n: NPO Project Manager WBP 2U4 GB-N Released By:                                                                                                                                                                                    | 4               |
| 3-15-84                                                                                                                                                                                                                             |                 |
| FLEL # 3                                                                                                                                                                                                                            |                 |
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| CHIEF WITS                                                                                                                                                                                                                          |                 |
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| Maris BAR NUCLEAR PLANT Affected Units /                                                                                                                                                                                            |                 |
| ect W PT13 BYTE                                                                                                                                                                                                                     |                 |
| com or Feeture Sys 26 (VARIOUS)                                                                                                                                                                                                     | †6              |
| Terence & Description of Change CORRECT BLECTRICAL DRAWING'S DUE                                                                                                                                                                    |                 |
| REVIEW OF LIGIC AND SCHEMATIC DIMERAM COMPATIB                                                                                                                                                                                      | 16174.          |
| TACK FORCE EXPANDED REVIEW (BLACK AND VELTE                                                                                                                                                                                         | <del>'4')</del> |
| FOAR LOGIC AND SCHEMATIC DRAWINGS REVIEW,                                                                                                                                                                                           |                 |
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| SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE                                                                                                                                                                                          |                 |
| SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE                                                                                                                                                                                          | TOTA            |
| SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE                                                                                                                                                                                          |                 |
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| SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE  V. DATE PRE-SECT. GROUPBRANCH ECN O.F. DESCRIPTION OF REVISION  ISSUED PARED SUPV. HEAD CHEF CLERK MGR.  DESCRIPTION OF REVISION                                                        |                 |
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TEMPESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN.

### ENGINEERING CHANGE NOTICE NO. 4666 DATA SHEET NO. \_\_\_\_\_

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| uparv            | acr: 🝎 i   | <u>G. L</u>                                   | <u>K</u> M  | m     | _101         |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                    | Ì               | <b>n</b>   |           |             |             |          |       |
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| Heed:            | 64         | $\mathcal{L}\mathcal{U}$                      | MM          | سلس   | <b>-  </b> 3 |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                    |                 | []         |           |             |             |          |       |
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| Projec           | · _W       | 778                                           |             |       |              | <u> </u>   | j: JA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 4.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                    |                 |            | -         |             | _           | ,        |       |
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| -                | LO         | E/C                                           | g!<br>RA    | SOH   | EMA<br>W     | BL         | ACA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | AGRA<br>K                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <u>M</u>   | COM<br>VBA         | PAI<br>TCh      | 1).        | LIT       | <u>v. 7</u> | 735/        | <u>~</u> | ORC   |
| -                | LO         | E/C                                           | g!<br>RA    | SOH   | EMA<br>W     | BL         | ACA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | AGRA<br>K AN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <u>M</u>   | COM<br>VBA         | PAI<br>TCh      | 1).        | LIT       | <u>v. 7</u> | 735/        | <u>~</u> | ORC   |
| -                | LO         | E/C                                           | g!<br>RA    | SOH   | EMA<br>W     | BL         | ACA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | AGRA<br>K                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <u>M</u>   | COM<br>VBA         | PAI<br>TCh      | 1).<br>2). | FS/<br>3) | <u>v. 7</u> | 735/        | <u>~</u> | ORC   |
| -                | LO         | E/C                                           | g!<br>RA    | SOH   | EMA<br>W     | BL         | ACA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | AGRA<br>K                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <u>M</u>   | COM<br>VBA         | PAI<br>TCh      | 1).<br>2). | LIT       | <u>v. 7</u> | 735/        | <u>~</u> | ORC   |
| -                | LO         | E/C                                           | g!<br>RA    | SOH   | EMA<br>W     | BL         | ACA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | AGRA<br>K                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <u>M</u>   | COM<br>VBA         | PAI<br>TCh      | 1).<br>2). | FS/<br>3) | <u>v. 7</u> | 735/        | <u>~</u> | ORC   |
| -                | LO         | E/C                                           | g!<br>RA    | SOH   | EMA<br>W     | BL         | ACA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | AGRA<br>K                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <u>M</u>   | COM<br>VBA         | PAI<br>TCh      | 1).<br>2). | FS/<br>3) | <u>v. 7</u> | 735/        | <u>~</u> | ORC   |
| -                | LO         | E/C                                           | g!<br>RA    | SOH   | EMA<br>W     | BL         | ACA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | AGRA<br>K                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <u>M</u>   | COM<br>VBA         | PAI<br>TCh      | 1).<br>2). | FS/<br>3) | <u>v. 7</u> | 735/        | <u>~</u> | ORC   |
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| -                | LO         | E/C                                           | g!<br>RA    | SOH   | EMA<br>W     | BL         | ACA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | AGRA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <u>M</u>   | COM<br>VBA         | PAI<br>TCh      | 1).<br>2). | FS/<br>3) | <u>v. 7</u> | 735/        | <u>~</u> | ORC   |
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| -                | LO         | SIC<br>DED<br>DATIS                           | # Ra        | SOM   | WING         | SE         | PASSED LASSED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | AGRAMAN AND THE STREET                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | SH.        | VEA<br>(Carl       | CAT<br>TCA      | ERSE S     | 3)        |             | 735/        | <u>~</u> | AND   |
| S                | E LOI      | DED<br>DATI                                   | ‡<br>Re     | SOM   | WING         | SE         | P.A.S.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | AGRANA AND THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE L | SH.        | VEA<br>(Carl       | CAT<br>TCA      | ERSE S     | FS 3)     |             | 735/        | <u>~</u> | AND   |
| S                | E LOI      | DED<br>DATI                                   | ‡<br>Re     | SOM   | WING         | SE         | P.A.S.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | AGRANA AND THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE L | SH.        | VEA<br>(Carl       | CAT<br>TCA      | ERSE S     | 3)        |             | 735/        | <u>~</u> | AND   |
| S                | E LOI      | DED<br>DATI                                   | ‡<br>Re     | SOM   | WING         | SE         | P.A.S.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | AGRANA AND THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE L | SH.        | VEA<br>(Carl       | CAT<br>TCA      | ERSE S     | 3)        |             | 735/        | <u>~</u> | AND   |
| S                | E LOI      | DED<br>DATI                                   | ‡<br>Re     | SOM   | WING         | SE         | P.A.S.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | AGRANA AND THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE LANGE THE L | SH.        | VEA<br>(Carl       | CAT<br>TCA      | ERSE S     | 3)        |             | 735/        | <u>~</u> | AND   |
| S                | E LOI      | DED<br>DATI                                   | ‡<br>Re     | SOM   | WING         | SE         | P.A.S.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | AGRA<br>AN<br>AVIEN<br>O AIIAE<br>CATEO O                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | SH. FRAWIN | VEA<br>(Carl       | CAT<br>TCA      | ERSE S     | 3)        |             | 735/        | <u>~</u> | AND   |
| S                | E LOI      | DED<br>DATI                                   | ‡<br>Re     | SOM   | WING         | SE         | P.A.S.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | AGRA<br>AN<br>AVIEN<br>O AIIAE<br>CATEO O                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | SH.        | VEA<br>(Carl       | CAT<br>TCA      | ERSE S     | 3)        |             | 735/        | <u>~</u> | AND   |
| S                | E LOI      | DED<br>DATI                                   | ‡<br>Re     | SOM   | WING         | SE         | P.A.S.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | AGRA<br>AN<br>AVIEN<br>O AIIAE<br>CATEO O                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | SH. FRAWIN | VEA<br>(Carl       | CAT<br>TCA      | ERSE S     | 3)        |             | 735/        | <u>~</u> | AND   |
| S                | E LOI      | DED<br>DATI                                   | ‡<br>Re     | SOM   | WING         | SE         | P.A.S.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | AGRA<br>AN<br>AVIEN<br>O AIIAE<br>CATEO O                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | SH. FRAWIN | VEA<br>(Carl       | CAT<br>TCA      | ERSE S     | 3)        |             | 735/        | <u>~</u> | AND   |
| S                | E LOI      | DED<br>DATI                                   | ‡<br>Re     | SOM   | WING         | SE         | P.A.S.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | AGRA<br>AN<br>AVIEN<br>O AIIAE<br>CATEO O                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | SH. FRAWIN | VEA<br>(Carl       | CAT<br>TCA      | ERSE S     | 3)        |             | 735/        | <u>~</u> | AND   |

Flore Meterials as follow

Additional Information

TEMPESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN.

## ENGINEERING CHANGE NOTICE NO. 4666

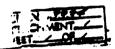
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# ENGINEERING CHANGE NOTICE COVER SHEET SWP 83 0120 500

(

| TENNESSES<br>IVISION OF<br>To: Cons | ENGIN        | EERING    | DESIGN  | (<br>Watts | Bar Nu        | dear Blass      | t, Spring City, IN                      | 50A W                  | 3334            |
|-------------------------------------|--------------|-----------|---------|------------|---------------|-----------------|-----------------------------------------|------------------------|-----------------|
|                                     |              | •         |         |            | 204 G         |                 |                                         |                        |                 |
| rom: Desig                          | n Project    | Manager   |         |            | 204 0         |                 | <del></del>                             |                        |                 |
| ATEJ                                | AN 20        | 1983      |         |            |               |                 |                                         | Budget                 | item 221        |
| ras IJ Analysi                      | is Require   | od:       | Yes _   | `          | <u>سا</u>     | •               |                                         |                        |                 |
| CHARLE                              | <u> </u>     | FIS       | HER     |            | SWP           |                 | E2                                      | anes                   | PP)             |
| 01                                  |              |           | رمه     |            |               | -               | The XX                                  | oll.                   | 1-17-83         |
| 7, 9                                | Toject E     | ngineer   | 342     | Refe       | 290G: _       |                 | Gesign Project M                        | Sper                   | Date            |
| •                                   |              |           |         |            |               | SCOPE           | . 0                                     | 0                      |                 |
| roject <u>JW</u> A                  | TTS          | BAR       | NU      | LEA        | R Pl          | ANT             |                                         | Affected Unit(s)       | 22              |
| ystem or Fee                        | ture_V       | ARID      | US      | SYS        | TEN           | 15              | No                                      | R WBN-SWP              | 8267            |
| -                                   |              |           |         |            |               |                 | TIC AND CO                              |                        |                 |
|                                     |              |           | • •     |            |               |                 |                                         |                        |                 |
| UKEE                                | -74          |           |         | MAKH       | 7/1.5         | ON V            | F124; F132; F                           | RUMENISE               | MR WE           |
| BLACK 1                             |              | ويوند     | FINDI   | <u>NGS</u> | <i>FII</i> 3; | <u>F/2.5;</u>   | F126;F132;F                             | : <u>801; F114; F1</u> | 1 SUPAZE        |
|                                     |              | in Bar    | VED:    | Yes        | Date          | Branch<br>Sheet |                                         | AAFEE                  | Yes or No       |
| (Data S                             |              | (ball     |         | No         |               | ilabie          | Approval Required                       | •                      | YES.            |
| . A                                 |              | 7         | SKIPI   |            |               |                 |                                         |                        |                 |
| 6                                   |              |           | 16      |            |               |                 | ECN is sessor for                       | pranch review:         | - W             |
| WINCE THE PERSONS                   | Tong State   | 3003      | Š       | NO         |               |                 | Design Preject                          | Landow .               | 1 <u>2-4-82</u> |
|                                     |              | n         | ,       | NO         |               |                 | FOR                                     |                        |                 |
| 2 Core                              | <b>7</b> . 4 | 5 - 3     |         |            | -             |                 | Approved:                               |                        |                 |
| -                                   | Z HEE        | 20 J      |         | NO         | . —           |                 | N/A                                     |                        |                 |
| Nug                                 | 7            | C.        |         | NO         | . —           |                 | E 41. 12                                | The las                | 12/28/9         |
| and then                            | y sésion (   | 100071    |         |            |               |                 | tos caterness                           |                        | Diffe           |
| <b>A</b> Civil                      | <b>9</b>     |           |         | NO         |               |                 | N/AU                                    |                        |                 |
| Electrical Control                  | i El, E      | 2         |         | YES        | _             |                 | tas menanta                             | W. GID                 | Date            |
| Mech                                | •            |           |         | NO         |               |                 | dd Wilder +                             | <u>~</u>               | 1-7-83          |
|                                     |              |           |         |            |               |                 | Chief Nuclear En                        | gineer                 | Date            |
| 1251L, <b>17700</b> 0 A             |              |           | C\$1 CD | MA         |               |                 | Required for PSAF                       | or FSAR                | Yes or No       |
|                                     | CS I ST PRO. |           |         | ND         |               |                 | Required for Preor                      |                        | NO .            |
| AACHI TEC                           | THREE BUFF   | 96T PAME  | •       | NO         |               |                 | If Yes, Test                            |                        |                 |
|                                     |              |           |         |            |               |                 | Vendor Backcharg                        |                        | ND              |
|                                     |              |           |         | _          |               |                 | Seismic Analysis R                      |                        | A C             |
| HYSICAL WOR                         |              |           |         |            | ,             |                 |                                         | Report Required        |                 |
|                                     | Pre-Op       | List Fuel | Power   | Commit     | 1st<br>Refuel |                 | QA Applies                              |                        | YES             |
| unger 12 2                          | T            | 1         |         |            |               |                 | Security System M<br>Vendor(s) involved |                        | NONE .          |
| Jart(1)                             | 1            |           |         |            |               |                 | A SUPPORTED THE SUPPORT                 | ··                     | A UNIE          |
|                                     |              |           |         |            |               |                 |                                         |                        |                 |
| (Attachmen                          |              |           |         | ; T -      |               |                 |                                         | 10624-5                | <del> </del>    |



### DIVISION OF ENGINEERING DESIGN NONCONFORMANCE REPORT

MEDS Accession No. SWY '82 1221 019

| _        | -                                                                                                                                               |                                             | _                  |            |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------|------------|
|          |                                                                                                                                                 |                                             |                    | vausure267 |
| _        | PLANT WATTS BAR NUCLEAR PLANT                                                                                                                   |                                             | 3 UNIT 1           |            |
| 回        | PREPARENORGANIZATION/DATE J. D. Collins/SWP/                                                                                                    | /December 21, 1982                          |                    |            |
| •        | DESCRIPTION OF CONDITION                                                                                                                        |                                             | _                  | 1          |
|          | Electrical drawing discrepancies has schematic, and connection drawings is result of the Black and Veatch third and Veatch finding numbers are: | for the auxiliary to<br>d party independent | review. The B      | Black      |
|          | F101, F102, F103, F104, F105, F106, F117, F123, F124, F127, F130, F131,                                                                         | F141, F802, F803,                           | 1804, 1803, 180    |            |
|          | Approximately 24 drawings have been                                                                                                             | identified with mi                          | lmor discrepanc:   | 103.       |
|          |                                                                                                                                                 |                                             |                    | ĺ          |
|          | •                                                                                                                                               | •                                           |                    |            |
|          |                                                                                                                                                 |                                             |                    |            |
| 1        |                                                                                                                                                 |                                             |                    | i          |
| حوا      | DATE OF OCCURRENCE EST ( X), ACT. ( ) 1978                                                                                                      | SIGNIFICANT COND                            | HTION ADVERSE TO O | WALITY     |
| 7        |                                                                                                                                                 | YES [                                       | NO [X]             |            |
| ومي<br>د | UNID CODE (EN DES-EP 8.01)                                                                                                                      | 10 -BRANCH CHIEF/DA                         | "Elle              | 12/21/82   |
|          |                                                                                                                                                 |                                             |                    |            |
| 1        | CORRECTIVE ACTION:                                                                                                                              |                                             |                    | •          |
| !        |                                                                                                                                                 | ·                                           |                    | <u> </u>   |
|          | · •                                                                                                                                             |                                             |                    | ;          |
|          |                                                                                                                                                 |                                             |                    |            |
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|          |                                                                                                                                                 |                                             |                    |            |
|          | •                                                                                                                                               |                                             |                    |            |
|          |                                                                                                                                                 |                                             |                    |            |
|          |                                                                                                                                                 |                                             |                    |            |
| -5       | CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REC                                                                                           | OUIREMENT YES                               |                    |            |
| •        | DESIGN CRITERIA DOCUMENT NO.                                                                                                                    | EXCEPT                                      | ION REQUEST NO.    | <u> </u>   |
| 1        | SCH REQUIRED YES NU LCN NO                                                                                                                      | 15 84                                       | CHEDULE IMPACT     | 0 0 0 0 4  |
| -        |                                                                                                                                                 |                                             |                    |            |

|              | HOEE VAL       |                                        | -          | -Ma Ban                                          |                                                  | . D.                                             | ATA S  | HEET         |                                              |               | 10.<br>— | 3334                                  | 90000       | -(SWP)         |
|--------------|----------------|----------------------------------------|------------|--------------------------------------------------|--------------------------------------------------|--------------------------------------------------|--------|--------------|----------------------------------------------|---------------|----------|---------------------------------------|-------------|----------------|
| ro:          |                |                                        |            |                                                  |                                                  | Plant, S                                         | Sude C | N IH         |                                              | <b>.</b>      |          | - 0 D.                                | (200        |                |
| ate:         | Design P       | noject Ma                              |            | VP 204                                           | LGUE                                             |                                                  |        |              | - '                                          |               | -        | The same of                           | rejust Mane |                |
|              | Section        |                                        |            | .                                                |                                                  | MEDA                                             |        | _            |                                              |               | 7        | MALUE ACCE                            | THE PAR     |                |
| 19471        | <u> </u>       |                                        |            | -6                                               | SWP                                              | <b>'83</b>                                       | n'     | 120          | 51                                           | n 1           | 24       | 1 -                                   |             |                |
| " <b>C</b> H | ARLES          |                                        | SHER       |                                                  |                                                  |                                                  | 0      | . <u></u>    | 5                                            |               | +        |                                       |             |                |
| ction        | 98 (RO):       | (RS)                                   |            | [i]                                              | SWP                                              | 83                                               | U.     | 314          | 2                                            | ייכ           | 3        |                                       |             | *              |
|              | or: W          | 1100                                   | PA         | <u>'</u>                                         |                                                  |                                                  |        |              |                                              |               | 2        |                                       |             |                |
| chite        |                | Y/A                                    |            | 2                                                | <u> </u>                                         |                                                  |        |              |                                              |               | 1        |                                       |             |                |
| oup<br>ladi  | 9.6            | 5. G                                   | Llin       |                                                  |                                                  |                                                  |        |              |                                              |               | 7        |                                       |             |                |
| enen<br>igf: | 7              |                                        | 707        | 160                                              | <del></del>                                      |                                                  |        |              |                                              |               | Ц        |                                       |             |                |
|              | WAT            |                                        |            |                                                  | 509                                              | D) 1                                             |        | COPE -       |                                              |               |          | Affected Units_                       | 122         |                |
| oject        |                |                                        | RIOUS      |                                                  |                                                  |                                                  |        |              |                                              |               |          |                                       | <u> </u>    | <u> </u>       |
|              | or Feeture     |                                        |            |                                                  |                                                  |                                                  |        | - 4 4 2 -    |                                              | ONT           | <u> </u> | CANNETTA                              | U 004       | MINAC          |
|              | ce & Desc      |                                        | <b></b> .  |                                                  |                                                  |                                                  |        |              |                                              |               |          | CONNECTION                            |             |                |
|              |                |                                        |            |                                                  |                                                  |                                                  |        |              |                                              |               |          | NSTRUMENT                             |             |                |
| EF           | BLA            | CK &                                   | YEA        | TCH                                              | FIN                                              | DIN                                              | GS_    | <u> F113</u> | <u>; F1</u>                                  | 25            | ;        | F126; F132,                           | FBOL        | <del>;</del> _ |
| : 114        | 1: E.1         | ــــــــــــــــــــــــــــــــــــــ |            |                                                  |                                                  |                                                  |        |              |                                              |               |          |                                       |             |                |
|              | _,             |                                        |            |                                                  |                                                  |                                                  |        |              |                                              |               |          |                                       |             |                |
|              | · ·            |                                        |            |                                                  |                                                  |                                                  |        |              |                                              |               |          |                                       |             |                |
|              |                |                                        |            |                                                  |                                                  |                                                  |        |              |                                              |               |          |                                       |             |                |
|              |                |                                        |            |                                                  |                                                  |                                                  |        |              |                                              |               |          |                                       | ٦ :         |                |
| 二            |                |                                        |            |                                                  | -                                                |                                                  | TED D  | RAWING       | 35 LIS                                       | , HEV         | / E. N   | ISE SIDE                              |             | 1707           |
| V. 0         | ATE PI         | 16. SEC1                               | . GROUP    | CHIEF                                            | CLERK                                            | D.P.<br>MGR.                                     |        |              | DE                                           | SCAIP         | TIO      | N OF REVISION                         |             | PAG            |
| 3-           | 14.83 JE       | Dan                                    | 190        | MA                                               | 7/7                                              | XSe                                              | Det    | ete/         | <u> </u>                                     | Dw            | 95       | SADD 2                                | dnes        | 3              |
| +            | $-\!\!\!\!+$   |                                        | +          | <del> </del>                                     | -                                                | ├┼                                               |        |              |                                              |               | -        |                                       |             |                |
| +-           |                | $\dashv$                               | +          | <del>                                     </del> | <del> </del>                                     | <del>                                     </del> |        |              |                                              |               |          |                                       |             |                |
| ╁            | _              | +-                                     | +          | <del> </del>                                     | <del>                                     </del> | + +                                              |        |              |                                              |               | _        | · · · · · · · · · · · · · · · · · · · | <del></del> |                |
| ╁            | _              | _                                      | +          | $\vdash$                                         | <del>                                     </del> | 1                                                |        |              |                                              |               |          |                                       |             |                |
| +-           | $\dashv$       |                                        | -          |                                                  | T                                                | 1                                                |        |              |                                              |               |          | ·                                     |             |                |
|              |                | $\neg$                                 |            | 1                                                |                                                  |                                                  |        |              |                                              |               |          |                                       |             |                |
| 'en. N       | •o. <u>W -</u> | 5534                                   |            | <u>*</u>                                         |                                                  |                                                  |        |              |                                              |               |          |                                       |             |                |
| -10 M        | alerian as     | lonows:                                |            |                                                  |                                                  |                                                  |        |              |                                              |               |          |                                       |             |                |
| ddilio       | nei Inform     | vation:                                |            |                                                  |                                                  |                                                  |        |              |                                              |               | _        |                                       |             |                |
|              | 007 PLASTIC    |                                        | M 8147.    | 471624                                           | <u>.                                    </u>     |                                                  |        | PLAST 3      | 976 HOTE<br>67100 PG<br>5863 G-6<br>40 (317- | MEST<br>WILLT |          |                                       |             |                |
| MCF, C       | TAIL CROUSE    |                                        | DOMESTIC N | -                                                |                                                  |                                                  |        | MESS. Y      | # 14 h                                       | 6             |          |                                       |             |                |
| (r. E        | PEGIAL BESI    | -                                      | 3, V20224  | H                                                |                                                  |                                                  |        |              |                                              |               |          |                                       |             |                |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | -    |                         | -      |               |              |               | <del></del>  | <del> 1</del> | <del>                                     </del> |             | Ų.          | 10 h                 | स्रा     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------------------------|--------|---------------|--------------|---------------|--------------|---------------|--------------------------------------------------|-------------|-------------|----------------------|----------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | COUT | Continue on the minimum | - N    |               | 700          | AST           |              |               | <del></del>                                      |             |             |                      | <b>(</b> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 122  | 45N720                  |        | 34            | <b>13</b>    | 3-9           | -93          | <u> </u>      | <del></del>                                      |             |             | <del></del>          | 1        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                         |        | لمليا         | _1           | ت             | igspace      | <u> </u>      | <b>——</b>                                        | ·           |             |                      | 4        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                         |        | لن            | لن           | لَنِا         | لنا          | <u></u>       | -                                                | ·           |             |                      | Ч        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                         | _      | L             | آن           | ت             | أسا          | <u> </u>      | <del></del>                                      | •           |             |                      | Ч        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                         | -      |               |              | لّبا          | لتنا         |               | <del></del>                                      | ***         |             |                      | H        |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 122  | 45W760-27-1             |        | Ц             |              | لمع           | لب           | -             | <del></del>                                      |             |             | <u> </u>             | Н        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 122  | 45N 600-35-2            | _      | $\Box$        |              | 3-7           | -83          |               | +                                                |             |             |                      | H        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                         |        |               |              | <u></u>       | -            |               | F-20                                             | Fre. C      | V. 101      |                      | H        |
| 182 45N600-3-3 - 3  182 45N600-3-4 - 3  182 45N600-3-6 - 4  182 45N600-3-7 - 3  182 45N600-3-7 - 3  182 45N600-3-9 2  182 45N600-47-1 3  182 45N600-47-2 5  182 45N600-47-5 4 229.83  182 45N600-47-7 5  182 45N600-47-7 5  182 45N600-47-8 5  182 45N600-47-10 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |                         | _      | -             |              | ننا           | 1            |               | 1                                                | 74 A        | <u> </u>    | 3                    | H        |
| 122 45N600-3-6-4-4-1  12 45N600-3-6-4-4-1  12 45N600-3-8-2-1  12 45N600-3-9-2  12 45N600-47-1  12 45N600-47-2  12 45N600-47-5  12 45N600-47-5  12 45N600-47-6  7 3-7-83  12 45N600-47-8  12 45N600-47-8  12 45N600-47-8  12 45N600-47-8  12 45N600-47-8  12 45N600-47-8  12 45N600-47-8  12 45N600-47-8  12 45N600-47-8  12 45N600-47-8  12 45N600-47-8  12 45N600-47-8  12 45N600-47-8  12 45N600-47-8  12 45N600-47-8  12 45N600-47-8  12 45N600-47-8  12 45N600-47-8  12 45N600-47-8  12 45N600-47-8  12 45N600-47-8  13 45N600-47-8  14 45N600-47-8  15 45N600-47-8  16 45N600-47-8  17 45N600-47-8  18 2 45N600-47-8  19 45N600-47-8  10 45N600-47-8  10 45N600-47-8  11 45N600-47-8  12 45N600-47-8  12 45N600-47-8  13 45N600-47-8  14 45N600-47-8  15 45N600-47-8  16 45N600-47-8  17 45N600-47-8  18 2 45N600-47-8  19 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  10 45N600-47-8  1 |      |                         | 13.    |               | <u>'</u>     |               | +            | <del>-</del>  | 1                                                | Fla. ED     | 11. 147 -   | -A                   | H        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                         | +      | $\sqcup$      | <u> </u>     | <u></u>       | -            | <u> </u>      | <del></del>                                      | 9. 4        |             |                      | H        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 182  | 45N600-3-6-             | +      |               | نسا          | 1             | 1            | <del> </del>  | +                                                |             |             |                      | H        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      | 45N600-3-7 573          | لقا    | لتنا          | سَنا         |               | +-           | <del></del>   | +                                                |             |             |                      | H        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      | 45N600-3-8              | +      | آتا           | <u> </u>     |               | <del> </del> | <del></del>   | +                                                |             | ·           | · · ·                | H        |
| 12 2 45N600-47-1 3  12 2 45N600-47-2 5  12 2 45N600-47-4 4  12 2 45N600-47-5 4 2.23-83  12 2 45N600-47-6 7 3-7-83  12 2 45N600-47-7 5  12 2 45N600-47-8 5  12 2 45N600-47-8 5  12 2 45N600-47-10 1  1 45N188 2  1 45N188 2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2  1 45N189-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1821 |                         |        | 1             | <u></u>      | -             | 4-           | <del></del>   | +                                                |             |             | <del>. ` ·    </del> | H        |
| 12 2 45N600-47-2 5  12 2 45N600-47-4 4  12 2 45N600-47-5 4 2.28-83  12 2 45N600-47-6 7 3-7-83  12 2 45N600-47-7 5  12 2 45N600-47-8 5  12 2 45N600-47-10 1  1 45N1688 2  1 45N1690-2  1 45N1690-2  1 45N1691-2  1 45N1691-2  1 45N1691-2  1 45N1691-2  1 45N1698-6  2 45N2688-6  2 45N2688-6  2 45N2688-6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 122  | 45N600-47-1             | _      |               | <u></u>      | _             | <del></del>  | <del></del>   | +                                                |             |             |                      | + 1      |
| 12 2 45N600-47-5 4 2.29-83  12 2 45N600-47-6 7 3-7-83  12 2 45N600-47-7 5  12 2 45N600-47-8 5  12 2 45N600-47-8 5  12 2 45N600-47-10 1  + 45N1690-2  + 45N1690-2  + 45N1691-2  + 45N1693-2  + 45N1693-2  + 45N1693-2  + 45N1693-2  + 45N1693-2  + 45N1693-2  + 45N1693-2  + 45N1693-2  + 45N1693-2  + 45N1693-2  + 45N1693-2  + 45N1693-2  + 45N1693-2  + 45N1693-2  + 45N1693-2  + 45N1693-2  + 45N1693-2  + 45N1693-2  + 45N1693-2  + 45N1693-2  + 45N1693-2  + 45N1693-2  + 45N1693-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |      |                         |        | 1             | <u></u>      | _             | -            |               | +                                                |             |             |                      | +        |
| 12 2 45N600-47-5 4 2:28-83  12 2 45N600-47-6 7 3-7-83  12 2 45N600-47-7 5  12 2 45N600-47-8 5  12 2 45N600-47-10 1  1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 122  | 45N600-47-4             |        | -             | <u></u>      | حے            | <u> </u>     | +             | +                                                |             |             | <u> </u>             | $\dashv$ |
| 12 2 45N600-47-6 7 3-7-83  12 2 45N600-47-7 5  12 2 45N600-47-8 5  12 2 45N600-47-10 1  +                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                         | 14     | -             | <u></u>      | $\overline{}$ |              |               | +                                                |             | <del></del> |                      | H        |
| 18 2 45N600-47-8 5  18 2 45N600-47-10 1  1 45N1686 2  1 45N1690-2  1 45N1691-2  1 45N1691-2  1 45N1693-2  1 45N1693-2  1 45N1693-2  1 45N1693-2  1 45N1694-2  1 45N1694-2  1 45N1694-2  1 45N1696-1  2 45N2686-1  2 45N2688-2  2 45N2688-2  2 45N2640-1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |      | 458600-47-6             | 17     | 1             | <u></u>      | 13-           | 7-83         | 4             | +                                                |             |             |                      | +-1      |
| 12 2 45N600-47-10  + 45N168 2  + 45N1610 1  + 45N1610 2  + 45N161-2  + 45N161-2  + 45N161-2  - 45N268 2  - 45N268 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 122  | 7                       |        | <del> </del>  |              | -             | <del> </del> | -             | +                                                |             |             |                      | +-       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 122  |                         | 15     | +             | <del> </del> | -             | -            |               | +                                                |             |             |                      | +-       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 182  | 45N600-47-10            | 11     | 4             | <u> </u>     | 1             | <u>Ł</u>     | <del></del>   | +                                                |             |             |                      | +-       |
| TSN/670-1<br>  TSN/670-2<br>  TSN/671-2<br>  TSN/671-2<br>  TSN/673-2<br>  TSN/673-2<br>  TSN/673-2<br>  TSN/675-1<br>  TSN/675-1<br>  TSN/675-1<br>  TSN/675-1<br>  TSN/675-1<br>  TSN/675-1<br>  TSN/675-1<br>  TSN/675-1<br>  TSN/675-1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                         | #      | <del>+=</del> | =            | <del>+</del>  |              | +             | Del                                              | e+e         |             |                      | ++-      |
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| +                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      | 45NH40-2                | #      | #             | =            | #             |              | ‡             | +                                                | <del></del> |             |                      | #        |
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| -   | 2      | 45N2691-2             |               | 121           | 123         |                                         | <del> </del>                                 |                  |                                         | •           |             | ╬┤                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| -   | 2      | 45N2413-E             |               |               |             |                                         | =                                            |                  | 1 - 525 %                               | <u> </u>    |             | +                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| ļ   | 2      | 45N2194-2             |               |               |             |                                         | =                                            |                  |                                         |             |             | +-1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|     | 122    | 45W760-3-1            | <del></del>   | 3-14          | 73          | <u> </u>                                | -83                                          |                  | <u> </u>                                | <del></del> |             | +                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|     | 122    | 45W760-3-2            | 6             |               | -           |                                         | 2-83                                         |                  |                                         |             |             | 4-4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| _   | 142    | 45W760-3-3            | 7             |               |             | 24.                                     | 73                                           |                  | ·                                       |             |             | +-                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|     | 122    | 45W760-3-4            | 7             | <u> </u>      |             | $\mu$                                   | <b>′</b> —                                   |                  |                                         |             | <del></del> | +-                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| _   | 122    | 45W760-3-11           | 3             |               |             | 3.2                                     |                                              | <del></del>      |                                         |             |             | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| _ [ |        | 45B1767-2A            | 7             | <u></u>       | !           |                                         | -13                                          |                  |                                         |             |             | 4_                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| _]  |        | 4581769-28            | 7             | <u></u>       |             | 2.9                                     | -13                                          |                  |                                         | <del></del> | <del></del> | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|     | 2      | 4582767-2A            | 7             | <u></u>       | لَـــا      |                                         |                                              |                  |                                         |             |             | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| _1  | 2      | 4582769-2A            | 7             |               |             |                                         |                                              |                  | *************************************** |             | ī           | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| -   | 122    | 45W751-4              | 13            |               |             | 24                                      | 8-8)                                         |                  |                                         |             |             | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| -   | 122    | 45W 751-10            | 11            |               |             | V                                       | <u>'                                    </u> |                  |                                         |             |             | 工                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| -   | 12.5   | 45W760-30-21          | $\sqsubseteq$ | $\sqsubseteq$ |             |                                         |                                              | Delete           |                                         |             |             | 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| -   | 122    | 45W760-30-23          | 3             |               |             | 3-2                                     | -83                                          |                  |                                         |             |             | T                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| _   | 182    | 45W760-62-2           | 17            |               | $\Box$      | $\Box$                                  |                                              |                  |                                         |             |             | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| -   | 1      | 45BM751               | 0             |               |             | $\Box$                                  |                                              |                  |                                         |             |             | $\perp$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| -   |        | 45B1767-0             | 10            |               |             |                                         |                                              |                  |                                         |             |             | 工                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| į   |        | 4581767-02            |               |               |             |                                         |                                              |                  |                                         |             |             | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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| •   | 2-     | 4582767-0             | 9             | 1             |             |                                         |                                              |                  |                                         |             | :           | $\int$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| -   | 2      | 4582767-02            |               |               |             | $\Box$                                  |                                              |                  |                                         |             |             | I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| -   | 2      | 4582769- 0.           | 0             |               |             | $\Box$                                  |                                              |                  |                                         |             |             | Ţ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|     | 2      | 4582769-02            | $\prod_{i}$   |               |             |                                         |                                              |                  |                                         |             |             | 工                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|     |        | 45N600-57.5           | 4             | Γ             |             | 3-1                                     | -83                                          |                  |                                         |             |             | $\int$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|     |        | 452600-57-22          | 2             | I             | $\Gamma$    | _                                       | 9-83                                         |                  |                                         |             |             | $oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{oldsymbol{ol}}}}}}}}}}}}}}}$ |
|     | · ·    | 45 N 600-57-24        | 3             | Ι             |             |                                         | 1-83                                         |                  |                                         |             | 4           | Ţ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| ٠   |        | 450600-57-26          | 2             |               |             | 1                                       | 143                                          |                  |                                         |             |             | $\perp$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| -   |        | 45060-57-31           | 4             | $\Box$        |             | _                                       | /-83                                         |                  |                                         |             |             | $\perp$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|     |        | 45460057=33           | <u></u>       | $oxed{\Box}$  | $\subseteq$ | $\sqsubseteq$                           |                                              | Delete           | 2.                                      |             |             | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|     |        | 454600-2              | 4/2           | 3-14          | - 73        | 3-                                      | 1-83                                         |                  |                                         |             |             | $\int$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| - 1 |        | 452600-5-1            |               | 厂             | _           | $\perp$                                 | 1:                                           |                  |                                         |             |             | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| į   |        | 42N 600 - 6 - 5       | 3             | $\perp$       | <u></u>     | $\perp$                                 | $\perp$                                      |                  |                                         |             | <u> </u>    | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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### SCOPE OF CHANCE ESTIMATE

| SYSTEM/FEATURE  Revisions  Revisions | by this s     | section v                                        | ill not require               |                       |                                                  | red below   |
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| TEMMENSEE VALLEY AUTHORITY<br>DIVISION OF CHAMBERING DESIGN                                                                                                             | DATA CM                               | NAGE NOTICE NO. <u>3534</u>                                                           | sauce Say?             |
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| Propering Section                                                                                                                                                       | MKDS Arrows                           | No. IN                                                                                | DE ASSESSADA           |
| FLECTRICAL "                                                                                                                                                            | SWP 183 01                            | 20 502                                                                                |                        |
| Dr. R. T. GRAHAM                                                                                                                                                        | SWP 83 01                             | 20 70-4                                                                               |                        |
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| Architects N/A                                                                                                                                                          | 2011 00 04                            |                                                                                       |                        |
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| Reference & Description of Change                                                                                                                                       | KEVISE TIME S                         | ETTINGS ON LOGIC                                                                      | DIAGRAMS               |
| TO AGREE                                                                                                                                                                | WITH THE FSAX                         | <b>.</b>                                                                              |                        |
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| REV DATE PRE- SECT. GROUP DA                                                                                                                                            | HIEF CLERK MOR.                       | DESCRIPTION OF REVISION                                                               | PAGES                  |
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| 2 W-12-83 UP 190 90 M                                                                                                                                                   | 1/A 77 VCO ADDED                      |                                                                                       | 2                      |
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| A Materian M Johanni                                                                                                                                                    |                                       |                                                                                       |                        |
| Meterian as follows: NA                                                                                                                                                 |                                       |                                                                                       | 1                      |
| Additional information:                                                                                                                                                 |                                       |                                                                                       |                        |
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| CHE, COST PLANDING AND CHATCH, STOPP, MI. SHE, AND TESTING, SEVERE SHOOT, MICH., MICH. SHEE, STOR, SHORESHOOD ON CHARGE SHOOT, SHEE, SECTION S. SHORESHOOD SHOOT, MICH. |                                       | LAT SPECTIVELESSET<br>HETTERETIES PROJECT MANAGER<br>194, 19403 C-4<br>me, 446 ESTS-E |                        |

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TEMPEREE VALLEY AUTHORITY

# ENGINEERING CHANGE NOTICE NO. 3334 DATA SHEET NO. 2

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|          |                       |        |                                                  |                                                  |                                                  |                                  | _                   |          |
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| 112      | 474611-3-3            | 3      | 8-1-83                                           | 4-13-13                                          |                                                  | PSACE NO MATOR                   | il                  | 1        |
| 1        | 476611-62-4           | 13     | 1                                                | 5.4.23                                           |                                                  | •                                |                     | 1        |
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| 142      | 47well 31-1           |        | 7 50 5                                           |                                                  |                                                  | DROTTO INC                       | 1                   | <b>.</b> |
| 182      | 47W611 - 31-4         | 4      | 4-15-53                                          | 4-6-83                                           |                                                  | An 246                           | Z                   | 1        |
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| ' Itan                                | Unit 1.<br>Qty                                              | Unit 2<br>Qry  | Procured By (EN DES/CONST) | PR, Reqn,<br>or Contr | Requested<br>Delivery<br>Date | Remar                                 |
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Section Supervisor

# TVA 19879C (EM 098-245) ENGINEERING CHANGE NOTICE COVER SHEET WBP '83 0 9 2 3 (BEFORE INSURANCE OF OPERATING LICENSEE)

| From: NPD Project Meneger                             | SWP 204 GB-K              |                                         |                          |
|-------------------------------------------------------|---------------------------|-----------------------------------------|--------------------------|
| DATE 8-26-83                                          | _                         | 83112 <b>1B0344</b>                     | 4                        |
| Was IJ Analysis Required: Yes                         | No                        | 1.0                                     | Ý                        |
| Kobert S. Untolak                                     | <u>Electric</u>           | egion ON A O Section                    | in Leader                |
| Larria Project Engineer                               | Released:                 | Wante Man                               | 9 23 27                  |
|                                                       | , , <u>s</u>              | COPE PAIN                               | _ <del></del>            |
| Project Watts Bar A System or Festure Residue         |                           | Affected U                              | nitisi                   |
| · · · · · · · · · · · · · · · · · · ·                 |                           | channel instrument numbers              | which inte               |
| lock the RNR letdore                                  | u velves (FCV-74          | -1,2). This decaments design            | en chames                |
|                                                       | o document the In         |                                         |                          |
| to automatically class                                |                           |                                         |                          |
| (Data Sheets Required)                                | O: Yes Date or Date Sheet | SUPPORT BRANCHES APPROVAL REQUIRED      | Yes or No.               |
| ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,               | No Available              | ECN is pathy for supplied which review: | _//                      |
| CIVIL ENGR SUPPORT BRANCH                             | #                         | NPOStraiget Market                      | 8/29/R                   |
| ELEC ENGR SUPPORT BRANCH                              |                           | Apploved:                               |                          |
| MECH ENGR SUPPORT BRANCH<br>NUCLEAR ENGR SUPPORT BRAN |                           | N/Ano                                   |                          |
| ARCH, SUPPORT BRANCH                                  | <b>7</b>                  | Civil Support St. Chief                 | 9-1-85                   |
| SPECIAL DESIGN PROJECTS                               | <u></u>                   | Electrical Support Br. Chief            | Dete                     |
| NUCLEAR PROJECTS DESIGN GI                            | ROUPS NA                  | NA                                      |                          |
| Civil                                                 | <b>A</b>                  | Means a State of Rr. Chief              | 9-20-67                  |
| Electrical E/                                         | YES                       | Engineer Engineer                       | Date                     |
| Mechanical                                            | <i>N</i> a                | Control Chief                           | Date                     |
| PHYSICAL WORK MUST BE DONE                            | SEPORE:                   | THORE OF COMM                           |                          |
|                                                       |                           |                                         | V A4                     |
| 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1               |                           | Required for PSAR or FSAR               | Y 00 N                   |
| Tool La                                               |                           |                                         | MA                       |
| Test Lar                                              | / <del> </del>            | Required for Preoperational Test:       |                          |
| Took La                                               | <b>士U</b> .               | •                                       |                          |
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| United 1 V United 2 V                                 |                           | •                                       | No.                      |
| United                                                | 7,14,9                    | •                                       | Ala<br>Ala<br>Ala<br>Yes |
| United 1 V United 2 V                                 | and live of               | •                                       |                          |
| United 1 V United 2 V                                 | unclosures<br>114 565     | •                                       | Yes                      |

| To: _                        |                     |                           |                     | 8 ens W                                      | er Nucle<br>04 GB-I | -                                                            | Sprin        |                               |                        | -                   |           | 2        | P        | FE C       | سبرا       | A01 1 |
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|                              | ectri<br>Lei        | eel.<br>H.A.A             | No.<br>LLL          | 7 34                                         | 2.4                 | WBP                                                          | '8:          | 30923                         |                        | 554                 | 64        |          |          |            |            |       |
| Total P                      | IRO                 | 12                        | 1                   | •                                            |                     |                                                              |              |                               |                        |                     | e<br>•    |          |          |            |            |       |
| Duparv<br>Basti E<br>Architi |                     | Y XX                      | Mars<br>A           | <u> </u>                                     | - R                 |                                                              |              |                               |                        |                     | 6         |          |          |            |            |       |
| Houd:<br>Br. CNI             |                     | Wa                        | m                   | <u>;                                    </u> | _[3]                |                                                              |              |                               |                        | ı                   | R<br>7    |          |          |            |            |       |
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| System                       |                     | secription                | n of Cha            |                                              | hang                | e p                                                          | res          | sure s                        | her                    | <u>ast</u>          | 10        |          |          |            |            | 115   |
|                              | 1.54                |                           | ton                 | las K                                        | ، قري               | , K                                                          | u 🎤          | 1.11                          |                        |                     | • / #     | CV-      | 74.      | 1.         | <b>)</b> ) |       |
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|                              | 9/30                | del                       | <u>CUM</u>          | ents                                         | de                  | Sign                                                         | L C          | hanges<br>mal po              | don                    | erai                | nd<br>lab | er E     | car      | 29<br>leci | 29.        |       |
|                              | 9/30<br>Perm        | dec<br>de<br>ussi         | CHA<br>CHA          | ents<br>ent<br>to                            | the auto            | Sign                                                         | veri<br>Vice | honges<br>mal per<br>ally clo | don<br>wer             | e u<br>avai<br>valv | nd<br>lab | er E     | car      | 29<br>leci | 29.        |       |
|                              | 9/30<br>Perm        | dec<br>de<br>ussi         | CHA<br>CHA          | ents<br>ent<br>to                            | de                  | Sign                                                         | veri<br>Vice | hanges<br>mal po              | don<br>wer             | e u<br>avai<br>valv | nd<br>lab | er E     | car      | 29<br>leci | 29.        |       |
|                              | 9/30<br>Perm        | dec<br>de<br>ussi         | CHA<br>CHA          | ents<br>ent<br>to                            | the auto            | Sign                                                         | veri<br>Vice | honges<br>mal per<br>ally clo | don<br>wer             | e u<br>avai<br>valv | nd<br>lab | er E     | car      | 29<br>leci | 29.        |       |
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TVA 10575A (EN DES-2-83)

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TEMPESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN.

### ENGINEERING CHANGE NOTICE NO. 4246 DATA SHEET NO. \_\_\_\_

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| AFFECTED                                          |                                       | DWG<br>REV.  | HOUSE<br>EXPOSTED                                | DATE   |              | REMARKS                                          | -                                      |
|---------------------------------------------------|---------------------------------------|--------------|--------------------------------------------------|--------|--------------|--------------------------------------------------|----------------------------------------|
|                                                   | DRAWING OR GAM HUMBER                 | 5            | 0. 20-02                                         | 9.3083 |              | RELATING                                         |                                        |
| 192                                               | 471611-74-1                           | 2            | 1-30-20                                          | 7:2012 |              |                                                  | , -                                    |
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## SCOPE OF CHANGE ESTIMATE

|                |               |                                                  | Procured By    | PR, Requ, | Requested<br>Delivery | • ,      |
|----------------|---------------|--------------------------------------------------|----------------|-----------|-----------------------|----------|
| Izem           | Unit 1<br>Qty | Unit 2<br>Qty                                    | (EN DES/CONST) | or Contr  | Date                  | Remarks  |
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Constant Charles and

DUC

# TERMESSEE VALLEY AUTHORITY



BNT-QCT-10.2, RII ATTACHMENT A PAGE 1 of 2

FIELD CHANCE REQUEST REPLY HEHDRANDUM

FCR MI. <u>F-3458</u> BLN 840402 TO : R. H. Hodges, Bellefonte Design Project Manager, 1117 IBM-K 580 Lonnie S. Cox, Project Manager, Bellefonte Nuclear Plant 3-30-84 APR 6.60 3 1984 Accention: LEONARD MADISON JUL 17 1984 SECTION 1 - CONST REQUEST DCR No. DCU-A Reason for change: ( Drawing Discrepancy Status Point: ( ) Facilitate Construction AUG 1 19RA (4) Prior to Fuel Loading ( ) After Fuel Loading But Prior (M Additional Design Information to Closing Capitallized A. co. ( ) After Closing Capitalized Accounts for Entire Plant SUPPORT F/L PC III RESP ENGR  $T 
i \mathbb{I}$ OF UNIT ACT NO. AZEI UNIT EE4-C DESCRIPTION 4-22-84 Structure(s)/System(s)\_ Aus BLDG/RU Contract No.\_ Drawings Affected 48A0892 - X2-5R5 £ 4840892- x2-9 86 Marked drawings/sketches required and attached? ( ) NO (MYES, No. Att's. Change Equested by:\_ JIMMY CHILDERS (Responsible Engineer) (Unit Supervisor) Inftial EN DES Contact: LEONARD MADISOR 3-29-84 (EN DES Engineer) (Date) Welding involved: ( ) NO (WYES, Approved by (WEU Engineer) (Date) Change approved by:\_ LEONARD MADISON 3-29-84 (DPO Engineer) (Date) Approval obtained by: (W Telephone

( ) Hemo

MEDS W5863 CK Asst. Const. Engr. or Const Engr.

Approved for transmittal to EN DES:

( ) Site Rep.

( ) Other

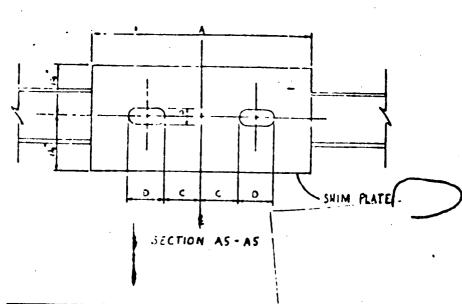
SECTION - EN DES REPLY/RESOLUTIOBLP '84 0 7 0 9 323 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Page 2 of 2 Pa

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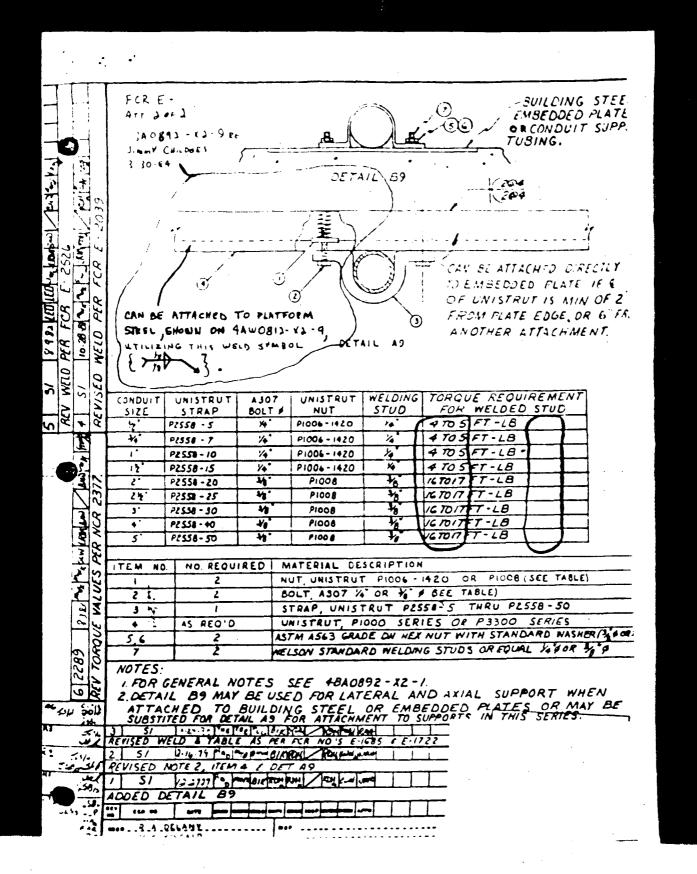
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FOR GENERAL MOTES SEE 4840892-X2-1 MAY BE INCESSED BY AT DISCRETION OF TVA FIELD TO FACILITATE INSTALLATION OF WELDED STUDS.

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ATT JOE 2 4BAORQJ-XJ-SE2 JIMMY CHILDERT 3-30-84



DOC ATTACHMENT A TENNESSEE VALLEY AUTHORITY PAGE 1 of 2 FIELD CHANCE REQUEST FCR NO E -3508 REPLY MEHORANDUM TO : R. H. Hodges, Bellefonte Design Project Hanager, 1117 IBN-K FROM: Lonnie S. C. to Project Manager, Bellefonte Nuclear Plant MTE: 4-26-84 JUL 17 1984 Attention: Lb RECEIVED SECTION I - CONST REQUEST DCR No. Reason for change: Drawing Discrepancy DCU-A Status Point: Facilitate Construction Prior to Fuel Loading SEP 4 1984 After Fuel Loading But Frior ( ) Additional Design Information 48 Glosing Capitalfred Accou After Closing Capitalized 1. W 8 27-84 Accounts for Entire Plant SUPPORT F/L PC III OF UNIT UNIT EEU DESCRIPTION Structure(s)/System(s) Contract No. 25K3-85550 Drawings Affected WLK 2 1314 - 198913 WLK21314-23 89K, WLK21314-2 WLK 21314 -11 Marked Hrawings/sketches required and attached? DQ NO ( ) YES, No. Att's. (Unit Supervisor) Initial EN DES Contact: Louis (EN DES Engineer) Welding involved: QC NO ( ) YES, Approved by (WEU Engineer) Change approved by: Dave Coun (Date) (DPO Engineer) Approval obtained by: D Telephone ( ) Memo ( ) Site Rep. Approved for transmittal to EN DES: WE Stone ( ) Other

EI

Asst. Const. E or. or Court Engr. or Project Manager

to the special report of the

BNP-QCP-10.2, RII

| SECTION - EN DES REPLY/RESOLUTION BLP                                           | 84 0 7 0 9 3 2                            | Attachme          |                                    |
|---------------------------------------------------------------------------------|-------------------------------------------|-------------------|------------------------------------|
| ECN No                                                                          | Date Tasue                                | a 6/18/84         |                                    |
| WLK81314.7 R915(4) 112915(4) -19 Drawing Nos.                                   | 7-2-44 827-2-40                           | D CONTRACT        | 7561. 81350                        |
| Change Complete: _M Mr. Otwens                                                  | PRHOEN                                    | b.                | JUL 9 1984                         |
| (ER DES Engineer)                                                               | getDesign Project                         | (inager)          | (Date)                             |
| Closed: Johnny W. Whinest                                                       | lant_                                     | R-3               | 0.84                               |
| (Responsible Engineer) Copy 1Return to CONST by EN DES Copy 2Retained by EN DES | Copy 3Retained by<br>Distribution to Assi | CONST until       | (Daté)<br>copy l is returned<br>s. |
|                                                                                 | BLN                                       | '840 9 O <u>9</u> | 5 816                              |

# FCRE E-3508

## Drawings W4KZ1314-7R914 and W4KZ1314-19R913

| . <b>.</b> . | Line No: 1572 reads from 7831-12 to 7831-32<br>Change it to read from 7831-12 to 7831-36  | SH 142                     |
|--------------|-------------------------------------------------------------------------------------------|----------------------------|
| 2.           | Jine NO: 1577 reads from TB31-32 to TB72-36 Change it to read from TB31-32 to TB71-32     | s# 142                     |
|              | Sine NO: 1581 reads from 7831-48 to 7831-49<br>Change it to read from 7831-48 to 7831-52  | SH 14291<br>SH 1434        |
| , ·          | Line NOI 1682 reads from 7831-48 to 7871-32 change it to read from 7831-36 to 7872-36     | SH 142 Unit<br>SH 143 Unit |
| 5.           | line NO! 1584 reads from 7831-52 to 7831-53<br>Change. it to read from 7831-38 to 7831-53 | s#. 14 <b>3</b>            |
|              | Jine No: 1585 reads from TB31-58 to TB31-59<br>Change it to read from TB31-49 to TB31-32  | S.H. 143                   |
| 7.           | Change repeat lines an sheet 109 to agree With line NOS: 1577 and 1582                    |                            |

# FCR E E - 3508

# Drawings WUKZ1314-11R914 and WUKZ1314-23 R914

| 1.          | line NO: 1327 reads from TB29-12 to TB29-32 change it to read from TB29-12 to TB29-36    | SH-107  |
|-------------|------------------------------------------------------------------------------------------|---------|
| 2.          | Sino No. 1333 reads from TB29-32 to TB62-36 Change it to read from TB29-32 to TB61-32    | 5H. 107 |
|             | Line No: 1337 reads from TB29-48 to TB29-49<br>Change it to read from TB29-48 to TB29-52 | sH. 106 |
| 4.          | Sino NO: 1338 reads from TB29-48 to TB61-22 Change it to read from TB29-36 to TB62-36    | SN 108  |
| 5.<br>6.    | Jine No: 1340 reads from 7829-52 to 7829-63<br>Change it to read from 7829-38 to 7829-53 | SH108   |
| <b>,</b>    | Sine NO: 1341 reads from TB29-58 to TB24-59<br>Change it to read from TB29-49 to TB29-32 | sH.108  |
| '? <b>.</b> | Change repeat lines on sheet 16 to agree with line NOS. 1333 1 1338                      |         |

EP: 4.01, 4.02. 04, 4.25

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INSTRUCTOR LTMCCORD

Sup SECTION E-1

|                       | SWP SECTION    | E-1                  | ,           |       | rative acc | ounc. |
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| And (LAST, FIRST, Mt) | S. S. NO.      | TITLE<br>SCHED/GRADE | TVA ADDRESS | BR/PR |            | DATES |
|                       |                | 3,3,20, 0,00,3,2     |             | _     | 7/29/82    |       |
| DORRIS, LERRY L       | 411-64-9669    | SEC SUPU , 11-5      | 167 GB-K    | SWP   |            |       |
| STAUB, JAMES E        | 307-18-8716    | 5D-4                 | 163-GR      | SWP   | 1          |       |
| GRAHAM, ROSS T        | 40 2 20 2 20 2 | 1. Enr. 50 3         | 16606-6     | SWP   |            |       |
| BECKNER, JOHN M.      | 409-92-0058    | ELEC. ENG 150-1      | 1           | SWP   |            |       |
| White, 0.4.           | 111-66-5917    | Engr, SD-3           | 1116 GB-K   | SWP   | 2          | ,     |
| Langley David         | 170-71-1900    | 100                  | 1877 Leve   | (uf-  |            |       |
| Benney V. W. Bran     | 409-72-9654    | DRAFTSMAN SE-        | 1121 68-1   |       |            |       |
| Fletcher, Con. H. W   | 251-86-9521    | Eke Eng SO-1         | 1118 GK-K   | SWA   | V          |       |
| Holl, J.              | 412-62-9047    | associate SE-6       | 11196B-K    | SWP   |            |       |
| WALTERS ROBURT        | -4/13-90-1522  | AIDE SE-4            | 1576B-K     | SWP   |            |       |
| Mc Cord, Larry T.     | 407-68-9741    | ELECENAR<br>SD-3     | 1117 63-K   | SWP   | ~          | į     |
| WEBB, JERRY IV.       | 4-16-54-3937   | eloc engr<br>50-3    | 15968-K     | 5WP   | ~          |       |
| WISEHEART DRAW L.     | 336-22-2188    | SE & ASSOC           | 1113 GB-K   | SWP   | V          |       |
| Perry, STEVEN         | 4/15-02-5403   | SE-5                 | 156 GB-K    | SWP   | /          |       |
| CRAIGE, JOHN S.       | 415-84-1317    | 50-4                 | 160GB-K     | SWP   | V          |       |
| FOX, MICHAEL H        | 244-13-1094    | 5E-5 ASSOC           | 165 GB-K    | SUP   | ~          |       |
| Smith, ADRIAN         | 200 40- 8505   | S1) - 3              | 1115 GB-K   | Swp   | V          |       |
| Dout Mitchely         | 232-60-3294    | i                    |             | SWP   | -          |       |
| /                     | ' i            | 1                    |             | ,     | 1          |       |

UNITED STATES GOVERNMENT

### Memorandum

TENNESSEE VALLEY AUTHORITY

三部ト 82022と 255

To : Those listed

FROM : M. N. Sprouse, Manager of Engineering Design, W11A9 C-K

DATE : FER 2/1/1982 820304FU419

SUBJECT: ENGINEERING PROCEDURES (EPs) - TRAIMING AND UTILIZATION

Root Cause IV of the EN DES 1982 Action Plan for Quality Improvement identified a number of problems with implementation of the current EN DES Engineering Procedures (EP) system, and established objectives for improvement in this area. The objectives included:

- Establish a training program to ensure that individuals are knowledgeable of procedures that govern their work,
- Emphasize that line managers are accountable for implementation of procedures in their respective areas.
- 3. Develop and enforce a "use or change" policy, and
- 4. Implement a feedback mechanism for EP users.

The purpose of this memorandum is to provide guidance on how these objectives are to be accomplished.

By June 1, 1982, each branch and project within EN DES is to develop and implement an internal training program to address all EPs which govern their work. As a minimum the training program shall include (a) identification of those EPs which significantly affect the work of each section; (b) an initial training phase to ensure employees are knowledgeable of the content of these procedures; (c) provisions for ensuring that employees are informed of revisions to procedures which govern their work; and (d) verification (at least annually) that the training program is being implemented and updated to address new procedures. The program should emphasize that the firstline supervisor is responsible for providing technical training—including the use of governing procedures—to his or her employees, and for ensuring that work is performed in accordance with these procedures.

I recognize that many of the EN DES EPs are overly prescriptive and restrictive. However, the fact remains that these procedures are a cornerstone of the EN DES quality assurance program and <u>must</u> be followed. As you are aware, we are currently conducting a thorough evaluation of the overall EP system to determine if programmatic changes are necessary. Until that evaluation is completed, we must continue to fully support and implement our existing procedures. I want to emphasize to all EN DES employees that it is the policy of this division to perform our work in accordance with established procedures and to initiate changes to those procedures when changes are necessary. We must set and sustain a "use or change" attitude among our employees.



Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

Those listed

FEB 2 6 1982

ENGINEERING PROCEDURES (EPs) - TRAINING AND UTILIZATION

EN DES-EP 1.01, "Preparation and Processing of EN DES Engineering Procedures" includes provisions for any EN DES organization to recommend changes to an EP by submitting its recommendation to the EN DES Manager. However, your feedback on this process has indicated that the time and effort necessary to change procedures has often been excessive.

In an attempt to improve on this process, Section 6.0 was added to EP 1.01 to provide for expediting revisions to EN DES-EPs. In addition, I am directing ESB to develop a program for designating an individual to serve as the lead EN DES contact for each procedure. This individual shall be responsible for providing clarification, when needed, to users of the procedure, and for timely implementation or resolution of proposed changes.

Please ensure that this memorandum is circulated to all employees.

Ma Contress

M. N. Sprouse

R. O. Barnett, W9D224 C-K

G. L. Buchanan, W3C126 C-K

H. B. Rankin, 204 GB-K

F. W. Chandler, W8C126 C+K

C. A. Chandley, W7C126 C-K

\*L. J. Cooney, W2D220 C-K

R. A. Costner, W11C126 C-K

A. T. Dean, W11C135 C-K G. R. Hall, 6204 MIB-K

W. D. Hall, W4D225 C-K

R. M. Hodges, 710 UB-K

J. E. Holladay, W2D224 C-K

S. B. Jack, 5100 MIB-K

K. T. Myers, W11B19 C-K

C. L. O'Dell, 235 UB-K

R. J. Ogle, W7C127 C-K

R. A. Painter, E5C80 C-K R. M. Parker, W4C126 C-K

J. L. Parris, 509 UB-K

John A. Raulston, W10C126 C-K

J. C. Standifer, 306 UB-K

O. P. Thornton, 102 SPT-K

J. P. Vineyard, W6C126 C-K

\* Please initiate the necessary actions to develop and implement a program for designating a lead EN DES contact for each EN DES-EP.

cc: G. H. Kimmons, W12A9 C-K ,MEDS, 100 UB-K

E22041.26

BC/PM

#### **EVALUATION SHEET**

Rev.

- 1. Task Force Category 4 for Watts Bar Nuclear Plant Unit 1
- 2. Task Force Category Description and Related B&V Findings:

Failure to design/maintain design records for AFW system as specifically described in the FSAR: F118, F121, F303, F304, F305, F306, F309, F313, F502, F504, F511, F513.

- 3. Evaluation for Cause
  - A. Preliminary

The design control process was not closely linked to FSAR commitments.

B. Final - TVA personnel involved in the design process on Watts Bar were not (in all instances) aware of the statements in the FSAR that describe various aspects of the plant's design for which they were responsible. Subsequently, as the Watts Bar design (and concurrent design documentation) evolved, changes in TVA's design (both in design philosophy and physical layout) have not been uniformly reflected in the FSAR via amendments to the docketed description. This assessment is applicable to both funits at Watts Bar.

Task Force Concurrence

- 4. Evaluation for Generic Examples
  - A. Preliminary

Given the cause and the base of findings, the situation does not lend itself to a sample approach for bounding the problem to the AFW system.

B. Final - B&V findings in this category deal primarily with discrepancies in documentation (actual versus FSAR-described) on the civil engineering design aspects of the Watts Bar AFW system. However, the discrepancies do involve other engineering disciplines (besides civil) and are of a nature such that they could not be described as documentation problems associated only with the AFW system. Therefore, additional sampling of the FSAR statements would not provide an accurate assessment of the scope of discrepancies. This assessment is applicable to both units at Watts Bar.

Resp. Org. Holin 3/16/84 Task Force Concurrence

- 5. Licensing Basis Satisfaction
  - A. Preliminary

For all examples, licensing basis is not satisfied even though there may be no safety significance.

B. Final
Certain findings in this category-F303, F304, F305, F306, F309 and F313--(i.e.,
location of design documentation) would not impact the licensing basis for Watts
Bar. However, other findings--F118, F121, F502, F504, F511 and F513--which
involve the application of design/analysis techniques different from that
described in the FSAR do not appear to satisfy the plant's licensing basis. This
assessment is applicable to both units at Watts Bar.

Resp. Org. LAChi 3/16/84 Task Force Concurrence 3/19/84

- 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work
  - A. Preliminary
    Memoranda NEB 821116 265 and NEB 830117 256 represent a valid FSAR correction
    process relative to assignment of scope, responsibilities, and timeliness. The
    criteria for the actual review are not identified and therefore cannot be
    determined to be effective in finding and correcting problems similar to those
    identified by B&V. The plan also needs to provide for accountability below the
    branch chief level.
  - B. Final

See continuation sheet (page 7)

Resp. Org. LHChin 3/16/84 Task Force Concurrence 4/184

- 7A. Identification of Corrective Action for Completed Work
  - A. Preliminary

The plan in 6AA should be issued in one document with clear criteria for assessment with respect to either a date or revision level applicable.

B. Final

See continuation sheet (page 7)

Resp. Org. LHalin 3/16/84 Task Force Concurrence 11/1 3/19/84

| 0110 | шр  | remember of and improve of confidence in the complete work                                                                                                                                                                                                                                                  |
|------|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | Α.  | Preliminary                                                                                                                                                                                                                                                                                                 |
|      |     |                                                                                                                                                                                                                                                                                                             |
|      | r   |                                                                                                                                                                                                                                                                                                             |
|      |     |                                                                                                                                                                                                                                                                                                             |
|      |     |                                                                                                                                                                                                                                                                                                             |
|      | в.  | Final                                                                                                                                                                                                                                                                                                       |
|      |     | EN DES-SEP 83-05, "Verification of Information Presented in Final Safety Analysi Report for Watts Bar Nuclear Plant," was issued August 17, 1983 (NEB 830818 852) This SEP describes EN DES reponsibilities for performing a verification of the WBN FSAR to ensure accuracy of existing or completed work. |
|      | Res | p. Org. NTClift 1 110184 Task Force Concurrence Il from 110184                                                                                                                                                                                                                                              |
|      |     |                                                                                                                                                                                                                                                                                                             |
| 9A.  | Ide | ntification and Evaluation of Ongoing Corrective Action for Future Work                                                                                                                                                                                                                                     |
|      | A.  | Preliminary                                                                                                                                                                                                                                                                                                 |
|      |     | Task force is not aware of any action currently directed toward this objective.                                                                                                                                                                                                                             |
|      |     |                                                                                                                                                                                                                                                                                                             |
|      |     |                                                                                                                                                                                                                                                                                                             |
|      | В.  | Final                                                                                                                                                                                                                                                                                                       |
|      |     | See continuation sheet (page 7)                                                                                                                                                                                                                                                                             |
|      |     |                                                                                                                                                                                                                                                                                                             |
|      | Res | p. Org. DTCliff 5/2/83 Task Force Concurrence 26 5/5/83                                                                                                                                                                                                                                                     |
|      |     |                                                                                                                                                                                                                                                                                                             |
| 10A. | Ide | ntification of Corrective Action for Future Work                                                                                                                                                                                                                                                            |
|      | A.  | Preliminary                                                                                                                                                                                                                                                                                                 |
|      |     | The design control process needs to be revised to provide a positive link to maintenance of an accurate FSAR.                                                                                                                                                                                               |

applicable to both units at Watts Bar.

В.

Final

The actions described in section 9% provide the additional controls needed to

more closely tie the design control process to the FSAR. This assessment is

| A.             | Preliminary                                                                           |                                                                              |                                                      |                                    |                      |
|----------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------|------------------------------------|----------------------|
|                |                                                                                       |                                                                              | ·                                                    |                                    | •                    |
|                |                                                                                       |                                                                              |                                                      |                                    |                      |
|                | •                                                                                     |                                                                              |                                                      | ·                                  |                      |
| в.             | Final                                                                                 |                                                                              |                                                      |                                    |                      |
|                | All future wo                                                                         | procedure for pro                                                            | olled by EP 2.01 R5.                                 | s and also inco                    | rporated             |
|                | information pon December 2                                                            | previously contair                                                           | ned in EPs 2.04 and                                  | 2.05. EP 2.01                      | R5 was issued        |
|                | •                                                                                     |                                                                              |                                                      |                                    |                      |
| Res            | sp. Org. 270                                                                          | Elift 113184                                                                 | Task Force Concurr                                   | ence Whom                          | 115184               |
| A. Ver         | ification of E                                                                        | ffectiveness of Co                                                           | orrective Action for                                 | Future Work                        |                      |
| A.             | Preliminary                                                                           | •                                                                            |                                                      | •                                  |                      |
|                |                                                                                       |                                                                              |                                                      |                                    |                      |
|                |                                                                                       |                                                                              |                                                      |                                    |                      |
|                |                                                                                       |                                                                              |                                                      |                                    |                      |
|                |                                                                                       |                                                                              |                                                      |                                    |                      |
| 77             | Fi1                                                                                   |                                                                              |                                                      | •                                  |                      |
| В.             | Final                                                                                 | OMS closure of t                                                             | hia aataaanu auslust                                 |                                    |                      |
| В.             | The basis for J. W. von Wei                                                           | QMS closure of t<br>senstein's memora<br>984 (QMS 841029 20                  | his category evaluat<br>ndum to Quality Mana<br>00). | ion sheet is no<br>gement Staff Fi | eted in<br>les dated |
| В.             | The basis for J. W. von Wei                                                           | senstein's memora                                                            | ndum to Quality Mana                                 | ion sheet is no<br>gement Staff Fi | eted in<br>les dated |
|                | The basis for J. W. von Wei                                                           | senstein's memora                                                            | ndum to Quality Mana                                 | gement Staff Fi                    | eted in<br>les dated |
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| Res            | The basis for J. W. von Wei October 29, 1                                             | senstein's memoral<br>984 (QMS 841029 20<br>20 11-7-50<br>d Evaluation of On | ndum to Quality Mana<br>00).<br>Task Force Concurr   | ence                               | les dated            |
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11A. Implementation of Corrective Action for Future Work

| 7B.  | Identification of Corrective Action for Completed Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |
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|      | A. Preliminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |               |
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| 0.0. | Implementation and Inspection of Corrective Action for Completed Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |               |
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| 9B.  | Identification and Evaluation of Ongoing Corrective Action for Future Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |               |
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|      | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |
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|      | B. Final                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ,             |
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| • 40 | Idei | itilication of Corrective | : ACTION | i for future | WOTK          |             |               |     |
|------|------|---------------------------|----------|--------------|---------------|-------------|---------------|-----|
|      | A.   | Preliminary               |          |              |               |             |               |     |
|      |      | N/A                       |          |              |               |             |               |     |
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| LB.  | Imp  | lementation of Corrective | Action   | for Future   | Work          |             | •             |     |
|      | A.   | Preliminary               |          |              |               |             |               |     |
|      |      | N/A                       |          |              |               |             |               |     |
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| ZD.  | ver  | ification of Effectivenes | s or Co  | orrective Ac | ction for Fut | ture work   |               |     |
|      | A.   | Preliminary               |          |              |               |             |               |     |
|      |      | N/A                       |          |              |               |             |               |     |
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|      | В.   | Final                     |          |              |               |             |               | j.  |
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TVA Task Force for Review of Black & Veatch Findings

### BLACK & VEATCH EVALUATION SHEET (Continuation Sheet)

\_\_\_\_\_\_\_\_\_\_

6A.

B. Criteria required for performing a formal review of existing FSAR material will be formally provided to the EN DES organizations responsible for validating the accuracy of this information. This criteria will be specific enough to identify discrepancies similar to the type found by Black and Veatch. Formal documentation of the review work will be required from the responsible organizations (RO); however, accountability below the branch chief/project manager level will not be required in the formal transmittal of new/revised FSAR material to the Nuclear Engineering Support Branch's Nuclear Licensing Section (NEB-NLS). Each RO will be responsible for the level of review/accountability for their particular FSAR sections. This assessment is applicable to both units at Watts Bar.

7A.

B. The memorandums referenced in section 6A will be superseded by the issuance of an EN DES special engineering procedure (SEP) which will identify (a) the current status (amendment no.) of the FSAR, (b) a division of responsibility (DOR) for reviewing particular FSAR sections to verify present information and/or update as required, (c) criteria to be utilized by the RO in performing this review, and (d) dates for (i) completion of the FSAR review (ii) submittal of formal verification of existing FSAR material accuracy and new/revised FSAR descriptions (reviewed and coordinated as rquired by EN DES-EP 2.01) to NEB-NLS, and (iii) submittal of all new/revised FSAR material received by NEB-NLS to POWER's Nuclear Licensing Staff. This assessment is applicable to both units at Watts Bar.

9A.

- B. The following actions taken or to be taken provide the additional assurance required that the FSAR will be more closely linked with the design control process:
  - 1. The DOR for FSAR section being developed as part of the EN DES-SEP discussed in section 7AB will serve to make affected EN DES personnel aware of their responsibility to keep the FSAR section(s) for which they are responsible up to date. The DOR will be maintained in a current status by NEB-NLS and updated as required to reflect changes in section responsibilities and/or organizational realignments.
  - 2. EN DES-EPs 2.01, 2.04, and 2.05 are being consolidated into one EP to clarify the FSAR preparation/revision process within EN DES. When the revised EP is issued, the affected EN DES organizations will be formally notified and concurrently requested to emphasize to their employees the importance of compliance with the procedure.
  - 3. EN DES-EP 4.02 has been revised to require (a) the preparation of data sheets which describe FSAR changes needed as a result of an engineering change notice (ECN) and (b) verification that all required FSAR changes have been sent to NEB-NLS prior to reporting by EN DES that all design work on an ECN has been completed.

This assessment is applicable to both units at Watts Bar.

TIED STA GOVERNMENT

### Memorandum

DATE : OCT 29 1904

TENNESSEE VALLEY AUTHORITY

841029 200 OMS

FROM : J. W. von Weisenstein, 384 SPB-K

Quality Management Staff Files

841031H0324

SUBJECT: ASSESSMENT OF ADEQUACY OF CORRECTIVE ACTION FOR FUTURE WORK FOR BLACK AND VEATCH TASK FORCE CATEGORY 4

> For this category, the TVA task force for review of Black and Veatch findings determined that the condition was applicable to Watts Bar units 1 and 2 and that corrective action was required for completed and future work. QMS performed a surveillance in accordance with the attached scoping document to access the adequacy of corrective action implementation for completed and future work, as well as the effectiveness of corrective action for future work. The results of that surveillance, contained in the attached surveillance report, verified the adequacy of the work accomplished.

Based upon our assessment of category 4, we conclude that this category can be closed by signing and dating item 12A, "Verification of Effectiveness of Corrective Action for Figure Work."

JvW:MBP

Atta Prient:

cc: E. ..Beasiey W12'21 C-K (Attachments)

I. .. Brick, 396 SPB-K

J S. C .ley, 374 SPB-K (Attachments) H. L. Jone , W10022+ C K

Puncin lly Prepared By: J. W. von Weisenstein (7706)

10/29/84 - EGB: "BP

Atta hments :

W. Cant∵ell, W11A9 C K

EDS, W5863

01840

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

JALITY MANAGEMENT STAFF
SURVEILLANCE RE ORT FOR THE ASSESSMENT
OF THE F FF TIVENESS OF CORRECTIVE ACTIONS
ITEMTIF ED EN THE TASK FOF DE REPORT ON THE
ACK ADD VEA CHEINDINGS

PLANT: Wat: 8 Bar Nuclear Plant Units 1 & 2
CATEGORY:

Prepare. By: White Variety

Approved By:

Date:

Concerns: NO / es / / 'if yes, dentify below)
Results:

- I. Management Summary: The design processes evaluated are outlined in the attached surveillance scoping document and were determined to be in full compliance with requirements.
- II. Conclusions and Recommendations: Rased upon the results of this surveillance, the corrective action implemented for both the completed and future work is adequate, and the effectiveness of corrective action for future work was also adequate.

### fif. Details:

- A. Performed the following surveillance activities to verify corrective action implementation for completed work:
  - Verify that EN DES-SEP 83-05 (NEB 830818 552) describes EN DES responsibilities for performing a verification of the WBN FSAR to ensure accuracy.

Results: EN DES-SEP 83 05 describes EN DES responsibilities for performing verification of the WBN FSAR for accuracy, updated through amendment 48. Many of the sections of the FSAR listed for review in EN DES-SEP 83 05 were changed but were not implemented in amendment 48. This was not a problem in that the changes were inprocess and were implemented in later amendments 49, 50, 51, and 52.

2. Select and review four ECMs.

 $R\underline{esults}\colon$  The following ECNs were reviewed, and the following individuals were interviewed:

- ECN 1973 Jim Hutson certain loadings to power train board changed.
- ECNs 4479 and 4480 Dennis Lashley shutdown board room chiller package added.
- ECN 3798 Richard Freeman valve numbers and valves 62-98 and 62-99 changed from closed to open.

Page 1 of 4

QUALITY MANAGEMENT STAFF
SURVEILLANCE REPORT FOR THE ASSESSMENT
OF THE EFFECTIVENESS OF CORRECTIVE ACTIONS
IDENTIFIED IN THE TASK FORCE REPORT ON THE
BLACK AND VEATCH FINDINGS

PLANT: Watts Bar Nuclear Plant Units 1 & 2
CATEGORY:

Prepared By:

J. Cht 200 / m/s

Approved By:

ite: 10.16

Continued:

The above ECNs were all a part of the implementation of the changes under SEP 83-05.

B. Performed the following surveillance activities to verify corrective action implementation for future work:

Review the division of responsibility document and verify that section supervisors are cognizant of their assigned FSAR responsibilities:

Results: Interviewed the following individuals and all are well aware of their responsibilities as related to maintaining the accuracy of the WBN FSAR:

Jim Ritts, NEB NLS Don Williams, NEB-NLS Bill Neely, CEB Joe Little, MEB L. E. Stanford, NEB

- C. Performed the following surveillance activities to assess the effectiveness of corrective action for future work:
  - Assess the effectiveness of the corrective action for two ECN packages which have FSAR revisions:

Based on the number of ECNs utilized to implement changes under SEP 83.05, expanded sample from one (1) to two (2).

Results: The following ECNs were reviewed, and the following individuals were interviewed:

- a. ECN 4516 Leo Klaes the value of supply fan rating was lowered.
- b. ECN 4766 David Leckie reduced loads in cabinets L1 and L2; changed tables 8.3-22 to 8.3-26 of FSAR.

Page 2 of 4

QUALITY MANAGEMENT STAFF
SURVEILLANCE REPORT FOR THE ASSESSMENT
OF THE EFFECTIVENESS OF CORRECTIVE ACTIONS
IDENTIFIED IN THE TASK FORCE REPORT ON THE
BLACK AND VEATCH FINDINGS

PLANT: Watts Bar Nuclear Plant Units 1 & 2
CATEGORY:

Prepared By: Joseph Valetta
Date: Oct 26.1994

Approved By:

Continued:

Verify that input to FSAR revisions is same as actual FSAR content.

Results: After reviewing ECNs, reviewed amendemnt 52 to the WBM FSAR to verify that revision inputs agreed with the actual content of the FSAR.

 Verify that the revision process was in accordance with revised EN DES-EP 2.01.

Results: The WBN FSAR revision process is in accordance with EMDES EP 2.01 R6 and will be handled likewise in the future.

 Verify that data sheets were prepared for revisions and work on ECNs was in accordance with EN DES-EP 4.02.

Results: ECN data sheets were prepared where required in accordance with EN DES EP 4.02 R15.

 Verify that changes were sent to NER-NLS prior to reporting that all ECN work was complete.

Results: Review of selected ECNs indicates that this was done.

#### IV. Documents Reviewed:

10CFR50
ANSI N45.2.11
WBN-FSAR amendment 52
EN DES-EP 2.01 R6 (ESB 840426 206)
EN DES-EP 2.07 R5 (ESB 831005 208)
EN DES-EP 4.02 R15 (ESB 831115 207)
ECN 4516 (WBP 840124 514)
ECN 1973 (BLP 830701 009)
ECN 4479 (WBP 831214 503)
ECN 4480 (WBP 831214 508)
ECN 3798 (WBP 830502 502)
ECN 4766 (WBP 840418 501)

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QUALITY MANAGEMENT STAFF
SURVEILLANCE REPORT FOR THE ASSESSMENT
OF THE EFFECTIVENESS OF CORRECTIVE ACTIONS
IDENTIFIED IN THE TASK FORCE REPORT ON THE
BLACK AND VEATCH FINDINGS

PLANT: Vatts Bar Nuclear Plant Units 1 & 2
Catrgory: 4

Prepared By: Date: Oct 26, 1984)

Approved By:

Continued:

### V. List of Personnel Contacted:

| Name                                                                                                                         | <u>Title</u>                                                                                                                                                                                 | Organization                                |
|------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| Richard Freeman Jim Hutson Leo Klaes Dennis Lashley Jim Ritts Don Williams Bill Neely Joe Little L. E. Stanford David Leckie | Nuclear Engineer Electrical Engineer Section Supervisor Electrical Engineer Nuclear Engineer Section Supervisor Section Supervisor Section Supervisor Section Supervisor Electrical Engineer | NEB EEB NEB EEB NEB-NLS NEB-NLS CEB NEB NEB |

VI. Scoping Document (Attached)

QUALITY HAMAGENERY STAPF
SCOPING DOCUMENT FOR THE ASSESSMENT
OF THE EFFECTIVENESS OF CORRECTIVE ACTIONS
IDENTIFIED IN THE TASK FORCE REPORT ON THE
BLACK AND VEATCH FINDINGS

PLANT: Watte Ber Nuclear Plant Units 1 & 2
CATEGORY: 4

Prepared By: J.E. Brock
Date: 9/18/04

Approved By: Date:

I. Verification of Corrective Action Implementation for Completed Work

Perform the following surveillance activity:

Verify that EN DES-SEP 83-05 (MEB 830818 852) describes EN DES responsibilities for performing a verification of the WBN FSAR to ensure accuracy.

II. Verification of Corrective Action Implementation for Future Work

Perform the following surveillance activity:

Review the division of responsibility document (DOR) maintained by NEB-NLS. Interview selected section supervisors to verify that they are cognizant of their assigned FSAR responsibilities.

III. Assessment of Effectiveness of Corrective Action for Future Work

Perform the following surveillance activity:

Assess the effectiveness of the corrective action for one ECM package which has FSAR revisions. Verify that selected input is the same as the actual FSAR content. Verify that the revision process was in accordance with the revised EP 2.01. Verify that data sheets were prepared and that the changes were sent to MEB-NLS prior to reporting by EM DES that all ECM work was completed per EP 4.02.

Page <u>1</u> of <u>1</u>

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TVA

TVA 10533 (EN DES-10-79)

# NEB '830818 TENNESSEE VALLEY AUTHORITY

Division of Engineering Design



| AR:SRS:MKL -<br>c: MEDS-CIS, WS | 1994<br>5 <b>863 C-K ENGINEE</b>                              | special<br>Ring Pro | CEDURE           | 84042                     | 20E0263          |    |
|---------------------------------|---------------------------------------------------------------|---------------------|------------------|---------------------------|------------------|----|
| ESB-PCS. S70                    | ) C-K<br>tt, W9D224 C-K                                       | 83-05               |                  | <u> </u>                  |                  |    |
| R. M. Pierce                    | ley, W7C126 C-K WATTS<br>e, 104 ESTA <del>-K</del>            | BAR NUCL            | EAR PLANT        | _                         |                  |    |
| J. C. Stand:<br>L. W. Lau, V    | ifer, 204 GB-K                                                |                     |                  |                           |                  |    |
| D. W. Wilson                    | n, W10D224 C-K<br>r, W10C136 C-KPleas<br>VERIFICATION OF INFO | se destro           | original         | SEP 83-05.<br>FINAL SAF   | ety analysis     |    |
|                                 | REPORT FOR WATTS BAR                                          | NUCLEAR             | PLANT            |                           |                  |    |
|                                 |                                                               |                     |                  |                           |                  |    |
| ,                               | ISSUE DATE:                                                   | August 1            | 7, 1983          |                           | 07 - 200         | ,  |
|                                 | AFFECTS: Engineerin<br>Architectu<br>Watts Bar                | ral Suppo           | rt Branch        | 1240 1                    | ^ / 2 <b>9</b> ( | J  |
| "T]                             | SEP IS NO LONGER                                              |                     |                  | RETIRED"<br>16/84<br>Date | <del>-</del> -   |    |
| C                               | John A. Raularon REVISION RO                                  | R1                  | R2               | R3                        | R4               | R5 |
|                                 | DATE 8/17/83                                                  |                     |                  |                           | İ                |    |
| PREPARED                        | Vince Biones Was                                              | )<br>               |                  | i                         |                  |    |
| SPONSORED                       | John A Pauliforg                                              | <b></b>             | ·<br><del></del> |                           | +                |    |
| REVIEWED                        | Pl Domen koz.                                                 | <u> </u>            | 1                |                           |                  |    |
| SUBMITTED                       | M.W. Ganker                                                   |                     | <u> </u>         | -                         |                  |    |
| APPROVED                        | M.M mouse                                                     |                     |                  | <u> </u>                  |                  |    |
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#### '830818 NEB

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## TENNESSEE VALLEY AUTHORITY

**Division of Engineering Design** 



NEB 830819251

SPECIAL ENGINEERING PROCEDURE

| EN | DES-SEP | 83-05 |
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|    |         |       |

WATTS BAR NUCLEAR PLANT

830025**K0187** (



| TITLE: | VERIFICATION OF | INFORMATION | PRESENTED | IN | FINAL | SAFETY | ANALYSIS |
|--------|-----------------|-------------|-----------|----|-------|--------|----------|
|        |                 |             |           |    |       |        |          |

REPORT FOR WATTS BAR NUCLEAR PLANT

ISSUE DATE: August 17, 1983

AFFECTS: Engineering Support Branches

Architectural Support Branch Watts Bar Nuclear Project

REVISION RO PREPARED **SPONSORED** John A Ravillon REVIEWED SUBMITTED APPROVED

TVA 10533 (EN DES-10-79)

## COORDINATION LOG

VERIFICATION OF INFORMATION PRESENTED IN FINAL
Title: SAFETY ANALYSIS REPORT FOR WAITS BAR NUCLEAR PLANT

|           |   |                 | <br>               |
|-----------|---|-----------------|--------------------|
| Revision: | 0 | RDenotes review | A-Denotes approval |
|           |   |                 |                    |

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EN DES: 5/83

## EN DES SPECIAL ENGINEERING PROCEDURE (SEP) INDEX

Page 4

|                   |     |                | <u> </u>                                                                                                                                           |                                |                                  |         |
|-------------------|-----|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|----------------------------------|---------|
| EN DES<br>SEP NO. | REV | DATE<br>ISSUED |                                                                                                                                                    | SPONSOR<br>ORGANIZATION<br>AND | APPECTED                         |         |
|                   |     |                | TITLE                                                                                                                                              | PREPARER                       | ORGANIZATIONS                    | REMARKS |
| 83-01             | 0   | 3-25-83        | Browns Ferry Nuclear Plant Instrument Line<br>Inspection Qualification Procedure                                                                   | CEB<br>K. D. Handy             | BWP<br>CEB                       |         |
| 83-02             | 1   |                | Final Review and Issue of Structures, Systems, and Components List Covered by Quality Assurance Program for Watts Bar Nuclear Plant                | NEB<br>R. K. Freeman           | CEB NEB<br>EEB PBB<br>MEB WBP    |         |
| 83-03             | 0   |                | Final Review and Issue of Structures, Systems,<br>and Components List Covered by Quality Assur-<br>ance Program for Bellefonte Nuclear Plant       | NEB<br>D. L. Kitchel           | ASB NEB CEB PBB EEB BLP MEB      |         |
| 83-04             | 0   |                | Special Contracts Originating Outside EN DES<br>that Require Handling, Processing, and Storage<br>of Engineering Documents by EN DES               | NEB<br>A. H. Robeson           | ASB MEB<br>BWP NEB<br>CEB<br>EEB |         |
| 83-05             | 0   | 8-17-83        | Verification of Information Presented in<br>Final Safety Analysis Report for Watts Bar<br>Nuclear Plant                                            | NEB<br>S. R. Stout             | ASB NEB<br>CEB WBP<br>EEB<br>MEB |         |
| 83-06             | 0   |                | Evaluation of Category I Structures at<br>Bellefonte Nuclear Plant for Seismic Analysis<br>Verification and Distribution of Seismic<br>Design Data | CEB A. B. Savery               | CEB BLP EEB MEB NEB              |         |
| 83-07             | 0   |                | Sampling Program for Identifying Distress in<br>Pipe, Instrument Lines, and Conduit Caused by<br>Building Settlement at WBN                        | CEB<br>S. K. Sherfey           | CEB<br>WBP                       |         |
| 83-08             | 0   |                | Identification, Evaluation, and Resolution of<br>Cable Bend Radius Problems at BLN and WBN                                                         | EEB<br>C. H. Sudduth           | BLP<br>EKB<br>MBP                |         |
| 83-09             | 0   |                | Mechanical Equipment Environmental Qualification<br>for Natts Bar Nuclear Plant                                                                    | MEB<br>T. R. Witmer            | EEB<br>MEB<br>MEB<br>WBP         |         |

TVA

VERIFICATION OF INFORMATION PRESENTED IN FINAL SAFETY AMALYSIS REPORT FOR WATTS BAR NUCLEAR PLANT

EN DES-SEP 83-05

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| 2.0 | DEFINITIONS                                                                                          | 1    |
| 3.0 | ACCOUNTABILITY AND RECORDS                                                                           | . 2  |
| 4.0 | PROCEDURE FOR PERFORMING A VERIFICATION OF THE FSAR AND DOCUMENTATING COMPLETION OF THE VERIFICATION | 3    |
| 5.0 | PROCEDURE FOR PROCESSING IDENTIFIED CHANGES                                                          | . 6  |
| 6.0 | ATTACHMENTS                                                                                          | •    |

VERIFICATION OF INFORMATION PRESENTED IN FINAL SAFETY ANALYSIS REPORT FOR WATTS BAR NUCLEAR PLANT

EN DES-SEP 83-05

#### **ABBREVI**ATIONS

10CFR50 - Title 10 of the Code of Federal Regulations, Part 50 - Division of Engineering Design

EN DES - Final Safety Analysis Report PSAR

- Management and Engineering Data Systems MEDS - Nuclear Engineering Support Branch - Nuclear Licensing S cion (NEB) NEB

NEB-NLS - Nuclear Regulatory . mission MRC RESS - Nuclear Steam Supply System

- Office of Engineering Design and Construction - Office of Power OEDC

POWER

POWER-NLS - Nuclear Licensing Staff (POWER) - Special Engineering Procedure SEP

ER DES-SEP 83-05

#### 1.0 PURPOSE AND SCOPE

This SEP describes EN DES's responsibilities for performing a verification of the Watts Bar Final Safety Analysis Report (PSAR), updated through Amendment 48 to ensure that the description of the facility, the design bases, and the safety analysis presented in the FSAR accurately reflect the as-designed plant configuration at fuel loading and comply with applicable regulatory and safety requirements. This review is required in order to address potential NRC concerns on the accuracy of material presented in the Watts Bar FSAR as a result of findings identified during the Black & Veatch independent review.

#### 2.0 DEFINITIONS

- 2.1 <u>Lead Organization</u> The engineering support branch or design project which has primary responsibility for a specific FSAR section as designated in Attachment A.
- 2.2 <u>Support Organization</u> The engineering support branch or design project responsible for assisting the lead organization for a specific FSAR section.

#### Note

Attachment A lists the support organizations for many sections of the FSAR but is not intended to be all inclusive.

- 2.3 <u>Reviewer</u> -- Support organization(s), NEB-NLS, and other organizations as requested by the lead organization.
- 2.4 Final Safety Analysis Report (FSAR) A document prepared in accordance with Regulatory Guide 1.70, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants," and submitted to the NRC in support of operating license applications. The FSAR describes the detailed design and configuration of the nuclear power plant at fuel loading and presents the evaluation and analysis necessary to conclude that the plant can be operated safely.

#### 3.0 ACCOUNTABILITY AND RECORDS

Each lead organization is responsible for the validity of the information in the FSAR section(s) as assigned in Attachment A.

Accountability below the branch chief/project manager level is left to the discretion of each organization. The branch chief/project manager's (or his designee's) signature on memorandums which either (1) declare that an FSAR section is correct as written or (2) transmit needed changes, will be treated by NE3-NLS as authorization to proceed accordingly. No further proof of coordination or concurrence by others will be obtained by Nuclear Engineering Support Branch's Nuclear Licensing Section (NE3-NLS). Each lead organization is responsible for assuring that any needed coordination or review is completed before transmittal to NEB-NLS. Each lead organization will be responsible for determining the need for, and maintaining any records of, the review and

coordination for each section for which the lead organization is responsible. Each lead organization is also responsible for performing the review and initiating any required changes in accordance with the schedule in Attachment B.

MEB-NLS will maintain a file of all documentation relative to the verification until the operating licenses for both units have been issued. All changes will be filed in Management and Engineering Data Systems (MEDS) Computer Indexed System (CIS) as a permanent record.

#### Note

FSAR sections designated with an asterisk in Attachment A were originally authored, in whole or in part, by Westinghouse. The lead organization for those sections should review that material for consistency with other TVA-prepared material and for obvious errors or known design changes which have been incorporated in the FSAR. (The lead organization for the review of Westinghouse-prepared text will not be held accountable as described above for the correctness of that information.)

4.0 PROCEDURE FOR PERFORMING A VERIFICATION OF THE FSAR AND DOCUMENTING COMPLETION OF THE VERIFICATION

#### Lead Organization

 Evaluates the need for assistance in verifying information in the section(s) of the FSAR for which they are responsible.

- 2. If assistance is not needed, proceeds to step 5.
- 3. If input, review, or other assistance is needed, coordinates with the appropriate support organization and specifically requests the needed information. (The degree of formality, traceability, or accountability associated with this coordination and assistance is left to the discretion of the lead organization.)

#### Support Organization

4. Assists the lead organization by providing the requested information needed to complete the review in a time frame which permits the lead organization to complete the review as scheduled.

## Lead Organization

- 5. Uses any source of information (including, but not limited to, design drawings, design criteria, design calculations, test results, equipment specifications, analyses, and information supplied by the support organizations) to verify the validity of the following information in each FSAR section as updated through Amendment 48.
  - a. Any assumptions presented in the FSAR are consistent with those used in the plant design.
  - b. Any quantitative values in the FSAR are correct.

EN DES-SEP 83-05

- c. Any functional descriptions are consistent with the operation of the plant and its equipment.
- d. Any physical descriptions accurately describe the current asdesigned plant.
- e. All references to other documents or other FSAR material are current and correct.
- f. All FSAR figures depict current revision of the appropriate TVA drawings.
- g. Conformance to all referenced codes, standards, regulatory guides, and general design criteria is accurately described.
- h. The FSAR conforms to Regulatory Guide 1.70, revision 0, for content and format.
- 6a. If all information in an FSAR section is verified as correct, documents this in a memorandum to the Chief Nuclear Engineer.
- 6b. If corrections are required, initiates the necessary changes as in section 5.0. Any errors which constitute a nonconforming condition must be documented and processed in accordance with EN DES-EP 1.26.

#### NEB-NLS

7. Maintains a file containing documentation that each FSAR section has been reviewed and is correct, or is correct with the noted FSAR text and/or figure changes and verification of transmittal of these changes to POWER-NLS. This file will be maintained until the operating licenses for both units have been received (all changes)

#### VERIFICATION OF INFORMATION PRESENTED IN FINAL SAFETY AMALTSIS REPORT FOR WATTS BAR NUCLEAR PLANT

EN DES-SEP 83-05

will be filed in MEDS-CIS as a permanent record). The results of the review will be documented by memorandum from the Chief Nuclear Engineer to the Manager of Engineering Design.

## 5.0 PROCEDURE FOR PROCESSING IDENTIFIED CHANGES

#### Lead Organization

 Coordinates the preparation of a draft within their organization and with the support organizations, if appropriate, to make the necessary changes. (The degree of formality, traceability, or accountability associated with this preparation and assistance is left to the discretion of the lead organization.)

## Support Organization

 Assists the lead organization by providing the requested information needed to make the necessary changes.

#### Lead Organization

3. Coordinates the review of the draft within their organization, the support organization, NEB-NLS, and all other EN DES organizations whose input could substantially affect the quality of the proposed material. (The degree of formality, traceability, or accountability associated with this coordination is left to the descretion of the lead organization.)

## VERIFICATION OF INFORMATION PRESENTED IN FINAL SAFETY AMALYSIS REPORT FOR WATTS BAR NUCLEAR PLANT

EN DES-SEP 83-05

#### Reviewers

 Review the draft for conformance to regulatory guides and for technical accuracy; submit any comments to the lead organization.

#### Lead Organization

 Resolves all comments; sends their coordinated draft, including drawings and/or figures pertaining to the text, by memorandum to the Chief Nuclear Engineer.

#### NEB

- Reviews the draft for licensability, format, completeness, consistency, and licensing commitments.
- Coordinates with the lead organization on any changes that affect the technical content of the report.
- 8. Processes any licensing commitments in accordance with EN DES-EP 2.07.
- Prepares a final draft for formal transmittal by memorandum to POWER-NLS.
- 10. Issues the transmittal memorandum for the final draft FSAR material which constitutes OEDC approval.

#### VERIFICATION OF INFORMATION PRESENTED IN FINAL SAFETY AMALYSIS REPORT FOR WATTS BAR NUCLEAR PLANT

EM DES-SEP 83-05

#### NEB-NLS

11. Resolves formally with the lead organization any substantive comments received on the final draft.

#### Note

NEB-NLS will retain any comment(s) for incorporation at a later date unless the comment(s) notes a significant technical error in the final draft that would compromise the licensability of the plant.

#### 6.0 ATTACHMENTS

- 1. Attachment A, FSAR Review and Update of Responsibilities
- 2. Attachment B, FSAR Update Schedule
- 3. Attachment C, Distribution for EN DES-SEP 83-05

## VERIFICATION OF INFORMATION PRESENTED IN FINAL SAFETY ANALYSIS REPORT FOR WATTS BAR NUCLEAR PLANT

EM DES-GEP 83-05 Attachment A Page 1 of 2

#### FSAR REVIEW AND UPDATE OF RESPONSIBILITIES

| FSAR Section                  | Lead Organization | Support Organization(s)                |
|-------------------------------|-------------------|----------------------------------------|
| 1.4 (all)                     | NEB               |                                        |
| 1.6 (all)                     | Neb               |                                        |
| 1.7 (all)                     | EEB               | NEB, WBP, Westinghouse                 |
| 2.1.1 & 2.1.2                 | CEB               | EDAS                                   |
| 2.2.1 6 2.2.2                 | CEB               |                                        |
| 2.2.3                         | Neb               |                                        |
| 2.4.1 - 2.4.11                | CEB               | MEB                                    |
| 2.4.13                        | CEB               |                                        |
| 2.4.14                        | neb               | CEB, WBP, EEB                          |
| 2.5 (all)                     | CEB               | WBP                                    |
| 3.1 (all)                     | NEB               | EEB, MEB, CEB, WBP                     |
| 3.2.1 & 3.2.2                 | NEB               | EEB, MEB, CEB, WBP                     |
| 3.3 (all)                     | CEB               | WBP, NEB                               |
| 3.4 (all)<br>3.5 (all)        | CEB               | WBP                                    |
| 3.6 (all)                     | CEB<br>CEB        | WBP, NEB, MEB                          |
| 3.7 (all)                     | CEB               | NEB, WBP<br>WBP                        |
| 3.8.1 - 3.8.5                 | CEB               | WBP                                    |
| 3.8.6                         | MEB               | CEB                                    |
| Appendix 3.8A                 | CEB               | 000                                    |
| thru 3.8D                     | -                 | •                                      |
| *3.9.1 - 3.9.3                | CEB               | NEB, MEB, Westinghouse                 |
| *3.9.4 - 3.9.5                | NEB               | CEB, Westinghouse                      |
| *3.10 (all)                   | CEB               | NEB, EEB, WBP, MEB, Westinghouse       |
| 3.11.1                        | neb               | EEB, MEB                               |
| *3.11.2                       | NEB               | EEB, MEB, Westinghouse                 |
| 3.11.3                        | neb               | EEB, MEB                               |
| *3.11.4 - 3.11.5              | NEB               | EEB, MEB, Westinghouse                 |
| 3.11.6                        | NEB               | EEB, MEB                               |
| *3.11.7                       | NEB               | NEB, Westinghouse                      |
| *4.1 - 4.4 (a11)<br>5.1 (a11) | NEB               | Westinghouse                           |
| *5.2 (all)                    | neb<br>Neb        | WBP, EEB, Westinghouse                 |
| <b>*5.3.1</b> - 5.4.3         | NEB               | EEB, WBP, Westinghouse<br>Westinghouse |
| *5.5 (all)                    | NEB               | MEB, EEB, Westinghouse                 |
| *5.6 (all)                    | EEB               | Westinghouse                           |
| *5.1.1 - 5.1.2                | NEB               | WBP, Westinghouse                      |
| 6.1.3                         | NEB               | WBP, MEB                               |
| 6.1.4                         | ASB               | MEB, NEB                               |
| *6.2.1 - 6.2.2                | NEB               | Westinghouse                           |
| *6.2.3 - 6.2.6                | NEB               | CEB, WBP, EEB, Westinghouse            |
| *6.3.1 - 6.3.3                | NEB               | EEB, WBP, Westinghouse                 |
| *6.3.5                        | EE3               | NEB, WBP, Westinghouse                 |
| 5.4 (all)                     | NEB               | EEB, WBP                               |
| 6.5 (all)                     | NEB               | WBP, EEB                               |
| 6.5.1                         | NEB               | Westinghouse, EEB                      |
| *6.5.2 - 6.5.4                | NEB               | NEB, Westinghouse                      |

## VERIFICATION OF INFORMATION PRESENTED IN FINAL SAFETY ANALYSIS REPORT FOR WATTS BAR NUCLEAR PLANT

EN DES-SEP 83-05 Attachment A Page 2 of 2

```
6.6 (all)
*6.7.18 - 6.7.19
                        NEB
                                                   HE B
                        NEB
                                                   Westinghouse
  6.8 (all)
                        NEB
                                                   UND
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No OEDC review is required for those sections not listed.

<sup>\*</sup>All or portions of these sections were originally authored by OEDC's NSSS contractor (Westinghouse). Please review these sections for accuracy and consistency with other OEDC prepared material.

<sup>\*\*\*</sup>All or portions of these sections were originally authored by POWER (TSESC).

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spplies.

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EN DES-SEP 83-05 Attachment B

#### FSAR UPDATE SCHEDULE

Date

Date of Issue

Review of FSAR by responsible organizations and development of coordinated FSAR changes if required

November 1, 1983-

Submittal of input to NEB-NLS by responsible organizations

November 15, 1983-

Submittal of OEDC input to POWER-NLS by NEB-NLS (final draft)  $% \left( \frac{1}{2}\right) =\frac{1}{2}\left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2}\right) \left( \frac{1}{2$ 

December 1, 1983

NEB-NLS will coordinate the resolution of any comments on the final draft as needed.

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|        | PREPARA | TION, RE | VIEW, AND | APPROVAL    |     |            |   |

March 4, 1975 ISSUE DATE: \_

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INFORMATION ONLY: Office of Power, Nuclear Licensing Staff

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TVA 10633 (EN DES-3-77) \* Names in typescript denote RO signatures.

## COORDINATION LOG

A-Denotes approval

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SAFETY ANALYSIS REPORTS (AMENDMENTS AND REVISIONS) Title: PREPARATION, REVIEW, AND APPROVAL
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R-Denotes review

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SAFETY ANALYSIS REPORTS (AMENDMENTS AND REVISIONS) - Title: PREPARATION, REVIEW, AND APPROVAL

REVISION LOG

EN DES-EP 2.01

| Revision<br>No. | DESCRIPTION OF REVISION                                                                                                                                                                                                                                                                                                                                         | Date<br>Approved |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| 5               | This general revision is a rewrite of the EP to combine information covered in EN DES-EPs 2.04 and 2.05 for scheduling, preparing, reviewing, approving, and revising PSARs, FSARs, and UFSARS. The combining of these EPs was a recommendation of the EN DES-EP Subcommittee. This revision responds to Audit P-82-6, Finding No. 3, and Audit D-83-6, Item 2. | 12/29/83         |
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#### ABBREVIATIONS

10CFR50 - Title 10 of the Code of Federal Regulations, Part 50

CIS - - Computer Indexed System (MEDS)

DIM - Design Input Memo

DIS - Drawing Information System

DOR - Division of Responsibility

ECN - Engineering Change Notice

EP - Engineering Procedure

ESB - Engineering Services Branch

FCR - Field Change Request

FSAR - Final Safety Analysis Report

MEDS - Management and Engineering Data Systems

NCR - Nonconformance Report

NEB - Nuclear Engineering Support Branch

NLS - Nuclear Licensing Section, NEB

NRC - Nuclear Regulatory Commission

NSSS - Nuclear Steam Supply System

OEDC - Office of Engineering Design and Construction

OL - Operating License

PBB - Planning and Budget Branch

POWER - Office of Power

PRS - Preparation and Review Schedule

PSAR - Preliminary Safety Analysis Report

SAR - Safety Analysis Report

UFSAR - Updated Final Safety Analysis Report

#### 1.0 PURPOSE AND SCOPE

This engineering procedure (EP) describes the Office of Engineering Design and Construction (OEDC) responsibilities for scheduling, preparing, reviewing, approving, and revising Preliminary Safety Analysis Reports (PSARs), Final Safety Analysis Reports (FSARs), and Updated Final Safety Analysis Reports (UFSARs). It covers the methods used for determining when Safety Analysis Report (SAR) revisions are required due to modifications in the design and construction of a nuclear plant, both preoperating license and postoperating license. It covers determining when an amendment to the SAR for a nuclear plant is required, as specified in Title 10 of the Code of Federal Regulations, Part 50 (10CFRSO). It defines interface requirements between OEDC and the Nuclear Licensing Staff in the Office of Power (POWER).

#### 2.0 POLICY

It is TVA's policy to conform to the appropriate regulatory requirements to ensure that the safety review of a nuclear plant is valid as described in the SAR. The Nuclear Regulatory Commission (NRC) requires in 10CFR50.34 that the FSAR description of (1) the plant design, (2) the analyses, and (3) the evaluations which lead to the conclusion that the plant can be operated safely and accurately reflect the current design and construction status of the plant.

#### 3.0 DEFINITIONS

- 3.1 Internal Draft--SAR input material in the stages from original preparation through review by the preparing organization and others providing direct input through the resolution of comments by those organizations; and through the OEDC-wide review conducted by the Nuclear Engineering Support Branch, Nuclear Licensing Section (NEB-NLS), and the resolution of comments. Upon completion of these stages, the material becomes an external draft.
- 3.2 External Draft--SAR input material in which all OEDC review is complete, through the office-level review including POWER and the NSSS vendor (conducted by POWER's Nuclear Licensing Staff), and the resolution of comments. After this processing, the material becomes a final draft.

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#### 3.0 DEFINITIONS (Continued)

- Final Draft--SAR input material in which the initial TVA-wide (including the NSSS vendor as appropriate) review and resolution of comments is complete; through the review and approval by NRC. After the initial TVA-wide/NSSS vendor review, the various office-level reviewers will not have seen each other's comments and a further review may be conducted by POWER's Nuclear Licensing Staff. The need for further review will depend on the gravity of the comments and the time available for review. If review is needed but time is not available, the material may be submitted to NRC, and a subsequent review by TVA may be conducted, with any necessary corrections being made in a subsequent amendment.
- Preparing Organization—In a broad sense, the office-level or NSSS vendor organizations which prepare designated portions of SARs; the organizations designated in the TVA—wide division of responsibilities (DORs). In the more restricted OEDC sense, the engineering support branches which have primary responsibility for preparing SAR material assigned to OEDC. POWER'S Nuclear Licensing Staff has the final authority in assigning preparing organizations at the office/NSSS level. NEB-NLS has the final authority in assigning preparing organizations within OEDC, and may itself prepare FSAR material as required.
- 3.5 Preliminary Safety Analysis Report (PSAR)--A document prepared in accordance with 10CFR50.34 and submitted to the NRC as part of the application for a construction permit. The PSAR describes the conceptual design and construction of the nuclear power plant and presents the evaluations and analyses to demonstrate its safety.
- Final Safety Analysis Report (FSAR)—A document prepared in accordance with 10CFR50.34 and submitted to the NRC in support of the operating licensing application. The FSAR describes in detail the final design and the actual construction of the nuclear power plant and presents the evaluation and analysis necessary to conclude that the plant can be operated safely. It should be noted that the information in the FSAR reflects TVA's commitments to NRC as defined by the applicable regulatory requirements and the appropriate design inputs developed by TVA. The FSAR does not meet the requirements of Regulatory Guide 1.64 concerning design verification and independent review.
- 3.7 Updated Final Safety Analysis Report (UFSAR)--The FSARs for nuclear plants with operating licenses are updated in accordance with regulation 10CFR50.71(e).

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#### 3.0 DEFINITIONS (Continued)

- 3.8 SAR Preparation and Review Schedule (PRS)—The schedule for preparation and review of SARs and amendments thereto. It includes a DOR and a schedule, and establishes the following:
  - a. The office level DOR for preparation and review of all portions of the SAR or SAR amendment.
  - b. The OEDC DOR for preparation and review of the SAR or SAR amendment.
  - c. The support organizations for the applicable portions of the SAR or SAR amendment.
  - d. The schedules for all of the above (a, b, and c) within OEDC and TVA wide including schedules for all drafts, reviews, and redrafting.
- 3.9 Unreviewed Safety Question--Defined in 10CFR50.59 and  $\overline{\text{EN DES-EP}}$  2.03.
- 3.10 Amendment--A change or addition to an SAR which is submitted to the NRC. Amendments to PSARs and FSARs are compiled by POWER's Nuclear Licensing Staff from revisions initiated by OEDC, POWER, other TVA offices, and/or the NSSS vendor. Amendments to UFSARs are initiated by annual updates after the UFSAR is issued. Each amendment is assigned a sequential number in the order in which it is submitted to the NRC.
- 3.11 Revision—Any specific addition to or change in an SAR. Several or many revisions normally make up an amendment. Revisions to PSARs and FSARs can be initiated by: (a) NRC information requests or position statements, (b) any knowledgeable person in any TVA organization, and (c) the NSSS vendor. Revisions initiated by OEDC, POWER, and others may be combined into an amendment by POWER's Nuclear Licensing Staff for submittal to NRC.

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## 4.0 PREPARATION, REVIEW, AND APPROVAL OF SAFETY ANALYSIS REPORTS

4.1 SAR Preparation and Review Schedule (PRS)

#### NEB (Nuclear Licensing Section)

- Establishes, maintains, and issues a DOR for PSAR, FSAR, UFSAR, and amendment preparation; updates and issues the DOR on an as-needed basis, but at least annually.
- Coordinates the submittal schedule for each PSAR and FSAR based on the plant construction schedule with POWER's Nuclear Licensing Staff; develops the schedules for UFSAR submittals which are dictated by 10CFR50.71(e).
- Prepares the OEDC PRS and coordinates it with the affected organizations; issues the PRS to all OEDC organizations which are involved and to POWER's Nuclear Licensing Staff.

#### 4.2 Preparation and Review of OEDC Prepared SAR Material

#### Preparing Organization

- Coordinates preparation of an internal draft of assigned sections of the SAR, including drawings, figures, and tables as follows:
  - a. PSAR Drafts--Reflect plant conceptual design.
  - FSAR Drafts--Reflect in detail the final design and incorporate responses to PSAR questions in the text.
  - c. <u>UFSARs</u>—Reflect the current plant as-constructed status no more than 6 months before UFSAR submittal and cover only design changes installed as of the cutoff date. The UFSAR text incorporates all responses to questions and all amendment material submitted to NRC after the FSAR was published. The first update on a given plant has no revision or amendment number and no revision markings to indicate text changes. Subsequent annual updates will consist of changed pages and will have sequential amendment numbers. Revisions to the previous issue will be noted by margin revision bars.

Issued design drawings may be placed in the PSAR/FSAR without review; but unissued drawings, figures, and tables must be handled in the same manner as SAR text.

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- 4.0 PREPARATION, REVIEW, AND APPROVAL OF SAFETY ANALYSIS REPORTS (Continued)
  - 4.2 Preparation and Review of OEDC Prepared SAR Material (Continued)

## Preparing Organization (Continued)

Draft material must be in accordance with all applicable conformance Information Sheet commitments provided in controlled sets of regulatory guides.

- Coordinates review of the internal draft within the preparing organization (branch or project) and with the support organizations (branches or design projects) which provided draft input.
- Sends the coordinated internal draft including drawings and/or figures pertaining to the text to NEB-NLS; also includes documentation of the review (step 2 above) in the memo.
- 4. For FSARs, provides to NEB-NLS evidence that any design or analysis changes have been initiated and includes the number of the issued Engineering Change Notice (ECN), Design Input Memo (DIM), design criteria revision, procedure revision, contract changes, design calculations, etc. When impractical to obtain such evidence on a schedule consistent with submission of the FSAR material, includes a commitment tracking form in accordance with EN DES-EP 2.07.

#### NOTE

The design project ensures that SAR text revisions are sent to NEB-NLS before related ECNs are reported complete (ref. EN DES-EP 4.02). This does not change other requirements of EN DES-EP 2.07. (This note does not apply to UFSARs.)

#### NEB (Nuclear Licensing Section)

5. Formally sends internal drafts in accordance with the DOR by memo for review and comment to all OEDC organizations whose input could substantially affect the quality of the proposed material.

#### Reviewers of Internal Draft

 Review the internal draft for conformance to regulatory guidance and for technical accuracy, and submit comments to NEB-NLS.

- 4.0 PREPARATION, REVIEW, AND APPROVAL OF SAFETY ANALYSIS REPORTS (Continued)
  - 4.2 Preparation and Review of OEDC Prepared SAR Material (Continued)

#### NEB (Nuclear Licensing Section) (Continued)

- Reviews the internal draft for licensability, format, completeness, consistency, and licensing commitments.
- Processes any licensing commitments in accordance with EN DES-EP 2.07.
- Coordinates and develops an external draft incorporating or resolving all comments received during the scheduled review period.

#### NOTE

If comments are received after the due date, NEB-NLS will retain the comments unless a late comment notes a significant technical error in the draft that would compromise the licensability of the plant, or if inclusion of the comments does not affect the SAR submittal schedule.

- Prepares the external draft for formal transmittal by memo to POWER's Nuclear Licensing Staff.
- 11. States in the transmittal memo for final draft OEDC-prepared SAR material that OEDC considers the transmitted material "design input" (for licensing purposes) in accordance with the terms of ANSI N45.2.11, and that the material should not be changed in substance without prior written approval of NEB-NLS.

#### Chief Nuclear Engineer, NEB, or Designee

 Signs the transmittal memo which constitutes OEDC approval of final draft SAR material and/or comments.

#### NEB (Nuclear Licensing Section)

 Resolves informally with the preparing organization any comments received on the TVA-wide external draft review conducted by POWER's Nuclear Licensing Staff.

- 4.0 PREPARATION, REVIEW, AND APPROVAL OF SAFETY ANALYSIS REPORTS (Continued)
  - 4.3 Coordination of Non-OEDC-Prepared SAR Material

#### MEB (Nuclear Licensing Section)

- Receives information requests from POWER's Nuclear Licensing Staff for OEDC input to internal drafts being prepared by other TVA offices or the NSSS vendor; coordinates the request within OEDC to get the needed information; and sends the information by memo to POWER's Nuclear Licensing Staff.
- Receives external drafts of SAR material prepared outside OEDC from POWER's Nuclear Licensing Staff; sends these drafts by memo for review, in accordance with established DORs, by OEDC organizations.

#### Reviewers of External Drafts

 Review external drafts for technical accuracy and conformance to regulatory guidance; send their comments to NEB-NLS.

#### NEB (Nuclear Licensing Section)

- Reviews the drafts for licensability, format, completeness, and consistency.
- Coordinates and compiles all comments of the drafts and prepares them for formal transmittal by memo to POWER's Nuclear Licensing Staff for resolution.

#### NOTE

If comments are received after the due date and after comment transmittal to POWER's Nuclear Licensing Staff, NEB-NLS will retain the comments unless a late comment notes a significant technical error in the draft that would compromise the licensability of the plant, or if inclusion of the comments does not affect the SAR submittal schedule.

6. States in the transmittal memo that OEDC considers the transmitted material "design input" (for licensing purposes) in accordance with the terms of ANSI N45.2.11 and that the material should not be changed in substance without prior written approval of NEB-NLS.

- 4.0 PREPARATION, REVIEW, AND APPROVAL OF SAFETY ANALYSIS REPORTS (Continued)
  - 4.3 Coordination of Non-OEDC-Prepared SAR Material (Continued)

#### Chief Nuclear Engineer, NEB, or Designee

- Signs the transmittal memo which constitutes OEDC approval of SAR material and/or comments.
- 4.4 Records of SAR Preparation

#### Preparing Organizations

- Maintain records of SAR preparation within their organizations and any other organizations which supply draft input; also maintain records of reviews conducted by their organization or a support organization of internal and external drafts.
- May destroy records documenting PSAR preparation when the construction permit is obtained or the application is withdrawn.
- 3. May destroy records documenting FSAR preparation after the operating license is received.

#### NEB (Nuclear Licensing Section)

- Keeps records documenting internal and external OEDC preparation and review of SAR material.
- Keeps records documenting that the preparing organizations prepared or reviewed amendment material.
- Keeps records showing that OEDC comments on non-OEDCprepared material were sent to POWER's Nuclear Licensing Staff or were otherwise resolved.
- Maintains and issues a DOR for preparation and review of SAR material.

#### 4.5 Distribution of Controlled Sets of SAR Material

#### NEB (Nuclear Licensing Section)

- Formally conducts a survey of OEDC to determine the number of copies of PSARs, FSARs, and UFSARs needed in OEDC.
- Informs POWER's Nuclear Licensing Staff of the number of copies required by OEDC.

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- 4.0 PREPARATION, REVIEW, AND APPROVAL OF SAFETY ANALYSIS REPORTS (Continued)
  - 4.5 Distribution of Controlled Sets of SAR Material (Continued)

## NEB (Nuclear Licensing Section) (Continued)

- Receives from POWER's Nuclear Licensing Staff copies of PSARs, FSARs, and UFSARs as they are issued to the NRC.
- Sends the distribution list and the copies of SAR material to the Engineering Services Branch (ESB), Procedures Control Section.

## ESB (Procedures Control Section)

 Distributes controlled copies of SAR material to those on the distribution list by memo from the EN DES Manager; includes a return receipt which will verify that the distributed material has been received and filed.

## Holders of Controlled Copies

File the SAR material upon receipt and sends the signed and dated return receipt to ESB's Document Control Center.

## ESB (Procedures Control Section)

- When all return receipts are received, sends the original transmittal memo and return receipt record to the Management and Engineering Data Systems (MEDS) Computer Indexed System (CIS).
- 5.0 PREPARATION, REVIEW, AND APPROVAL OF AMENDMENTS AND REVISIONS
  - 5.1 Initiation and Scheduling of Amendments and Revisions

POWER's Nuclear Licensing Staff determines when PSAR/FSAR amendments are required. OEDC (NEB-NLS) and other TVA offices may submit SAR revisions to POWER's Nuclear Licensing Staff at any time.

- 5.0 PREPARATION, REVIEW, AND APPROVAL OF AMENDMENTS AND REVISIONS (Continued)
  - 5.1 Initiation and Scheduling of Amendments and Revisions (Continued)

There are various sources for identifying changes which must be made in PSARs and FSARs to keep them current. These include:

- a. Responding to NRC questions which impact plant design.
- b. Reanalysis of various plant parameters and events due to revised bases or improved methods.
- c. Changes in TVA or NSSS vendor organization or procedures reflected in the FSAR.
- d. Changes in the plant design (i.e., ECNs and Field Change Requests [FCRs]).
- e. Revolution of Nonconformance Reports (NCRs), inspection report items, etc.

The FSARs for nuclear plants with an operating license (OL) are updated in accordance with 10CFR50.71(e). That regulation specifies that an original updated FSAR (UFSAR) must be filed with NRC within 2 years of the date of the OL. Subsequent amendments to the update must be made no less frequently than annually. (Note: TVA's policy is to submit amendments annually.) The updates are to reflect the status of the plant as of no more than six months before filing of the update.

The original FSAR is the legal licensing document; it will not be further revised, but will remain in the NRC docket file. The update is a separate new document which reflects the current plant status.

## 5.1.1 Amendments to PSARs and FSARs Initiated by NRC

## NEB (Nuclear Licensing Section)

- After receiving formal or draft NRC information requests or position statements, prepares a draft PRS.
- Informally coordinates review of the draft PRS with OEDC branches and staffs indicated in the DOR as preparing or reviewing SAR amendment material and with POWER's Nuclear Licensing Staff.
- 3. Resolves comments on the draft PRS.

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- 5.0 PREPARATION, REVIEW, AND APPROVAL OF AMENDMENTS AND REVISIONS (Continued)
  - 5.1.1 Amendments to PSARs and FSARs Initiated by NRC (Continued)

## NEB (Nuclear Licensing Section) (Continued)

Writes the final PRS, which, along with NRC information requests or position statements, is sent from NEB-NLS to all affected OEDC organizations and POWER's Nuclear Licensing Staff.

#### Preparing Organization

5. Reviews each NRC request or position statement in detail within the preparing organization (branch or project) and with the support organizations (branches or projects) from which draft input may be required; immediately notifies NEB-NLS if clarification of NRC material is needed or to propose a new completion date if the response cannot be prepared by the scheduled submittal date. In the latter case, gives NEB-NLS an expected completion date.

## NEB (Nuclear Licensing Section)

- 6. Immediately notifies POWER's Nuclear Licensing Staff if clarification of NRC material is needed or to propose a new completion date if the response cannot be prepared by the scheduled submittai date.
- 5.1.2 Revisions to PSARs and FSARs Initiated by OEDC

#### Preparing Organizations

- Review changes in the plant's layout, design, and/or analyses to determine if the SAR will need revising to reflect the changes; similarly review organization changes.
- Notify NEB-NLS (formally or informally) of any changes that require SAR revisions and include specific references to text, tables, and/or figures.

#### NEB (Nuclear Licensing Section)

 Verifies and/or coordinates the need for proposed PSAR/FSAR revisions and notifies POWER's Nuclear Licensing Staff.

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- 5.0 PREPARATION, REVIEW, AND APPROVAL OF AMENDMENTS AND REVISIONS (Continued)
  - 5.1.3 Revisions to UFSARs

## NEB (Nuclear Licensing Section)

Coordinates the scheduling of each UFSAR annual amendment with POWER's Nuclear Licensing Staff; sends the schedule requirements by memo to the preparing organizations which are involved.

- 5.2 Preparation of Amendments and Revisions
- 5.2.1 Revisions Initiated by NRC

NRC information requests on PSARs and FSARs are usually addressed in a separate volume of each SAR. The response for each request should take one of the following three forms, which are listed in order of preference:

- a. A specific reference to a section(s) of the SAR which contains the requested information or has been revised in response to the NRC request. This format is especially appropriate for material that should remain in the SAR permanently through the PSAR, FSAR, and UFSAR stages.
- b. A reference to original or revised SAR text material, with some amplifying statements.
- c. When a revision of SAR text is judged inappropriate, an independent response to the question should be provided in the question and response volume, together with supporting figures and tables. Responses inappropriate for the SAR text include those requiring a level of detail beyond that normally presented in SARs.

Amendments may include engineering reports which are submitted to the NRC as separate documents. In such cases, reference(s) to the reports must be made where necessary in the SARs.

## 5.2.2 Textual and/or Tabular Changes

## All OEDC Organizations

Provide NEB-NLS with any necessary textual and/or tabular revisions that are not identified in the ECN review.

SAFETY ANALYSIS REPORTS (AMENDMENTS AND REVISIONS) - PREPARATION, REVIEW, AND APPROVAL

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- 5.0 PREPARATION, REVIEW, AND APPROVAL OF AMENDMENTS AND REVISIONS (Continued)
  - 5.2.3 Unreviewed Safety Questions (for OL Plants)

When a plant modification involves an unreviewed safety question (in accordance with EN DES-EP 2.03), NRC approval is required before the change is made. This is handled by submitting a license amendment request to the NRC describing the modification. The modification, after its completion in the field, will be described in the next FSAR update in accordance with subsection 5.1.

# 5.2.4 General Preparation

# Preparing Organization

- Coordinates the preparation of amendment material within the preparing organization (branch or project) and within the support organizations (branch or project) from which draft input may be required; follows requirements of subsection 4.2.
- Reviews design changes and revised drawings to determine if textual and/or tabular SAR changes will be required; makes text and tabular changes when required.
- Notes revisions to existing textual and tabular material in PSARs, FSARs, and UFSARs by vertical revision bars in the right margin.

#### NOTE

Design changes must be initiated before PSAR and FSAR drafts are submitted. Design changes reflected in FSAR revisions for construction permit (CP) plant must be implemented before the plant becomes operational. All FSAR changes (text and drawing changes) need to be submitted as an integrated package so that the NRC can review the FSAR text changes with the changes to the FSAR figures. For UFSAR revisions, the design and installation of a plant modification must be completed at least 6 months before the change is included in a scheduled UFSAR revision.

 Sends completed work to NEB-NLS for further processing in accordance with subsection 4.2.

- 5.0 PREPARATION, REVIEW, AND APPROVAL OF AMENDMENTS AND REVISIONS (Continued)
  - 5.2.4 General Preparation (Continued)

Preparing Organization (Continued)

#### NOTE

The preparing organization includes evidence with the amendment material (except for UFSAR revisions) that any design or analysis changes have been initiated. This evidence might include the number of the issued ECN, DIM, design criteria revision, procedure revision, contract change, design calculation, etc. If it is impossible to obtain such evidence on a schedule consistent with that for submission of the amendment material, a commitment tracking form is included in accordance with EN DES-EP 2.07.

Design projects must ensure that SAR text revisions are sent to NEB-NLS for issue before related ECNs are reported complete. (This does not apply to UFSAR revisions.)

# 5.2.5 Revisions Initiated by TVA

# NEB (Nuclear Licensing Section)

- Reviews revisions proposed by OEDC personnel (see 3a. and 3b. below).
- Serves as OEDC coordinator for revisions initiated by the NSSS vendor or by non-OEDC TVA organizations; distributes this material in accordance with the DOR for OEDC review.
- 3a. If a proposed revision involves only editorial changes, typographical corrections, or changes directly resulting from new or revised issued design documents, NEB-NLS provides the changes formally to POWER's Nuclear Licensing Staff for inclusion in a scheduled amendment.
- 3b. If a proposed revision involves significant technical changes to the SAR, NEB-NLS follows the requirements of subsection 4.2 for preparation, review, and approval.

# SAFETY AMALYSIS REPORTS (AMENDMENTS AND REVISIONS) - PREPARATION, REVIEW, AND APPROVAL

EN DES-EP 2.01

- 5.0 PREPARATION, REVIEW, AND APPROVAL OF AMENDMENTS AND REVISIONS (Continued)
  - 5.2.6 Check on Proper Drawing Revisions

# NEB (Nuclear Licensing Section)

- Compiles a drawing information system (DIS) comparison list of all TVA drawings included in the FSAR during its preparation or shortly after its submittal to the NRC; includes in this list the figure revision currently in the FSAR and the latest revision of the drawing.
- Periodically receives from the Planning and Budget Branch (PBB) a computer listing of the status of all TVA figures on each specific plant.
- Compares the PBB computer listing with the DIS comparison list of TVA drawings to determine if any TVA FSAR figures have been revised.
- 4. Keeps the DIS comparison list current with the computer listings by adding the most recent revision of each particular drawing. Compares the most recent drawing revisions with the respective SAR figures to determine whether SAR text and/or figure changes are needed. The latest drawing revisions are normally incorporated into the SAR, but need not be in cases where minor detail changes do not affect the SAR level of detail.

The SAR figures may show plant design advanced beyond the actual plant status. This is acceptable even at the time of OL, since at that time the actual plant status is reflected in the open work item list, in the unimplemented design item evaluations, and in the plant safety evaluation report.

 Coordinates the proposed figure changes with the EN DES organization responsible for the FSAR section(s) affected by the revisions.

#### 5.2.7 Amendments to UFSARs

# NEB (Nuclear Licensing Section)

 Accumulates a file of correspondence, ECN logs, etc., for each OL plant to aid in identifying material to be included in the next annual UFSAR amendment; reviews material to determine what sections are affected by the material.

- 5.0 PREPARATION, REVIEW, AND APPROVAL OF AMENDMENTS AND REVISIONS (Continued)
  - 5.2.7 Amendments to UFSARs (Continued)

# Preparin ganization and NEB (Nuclear Licensing Section)

 Review all ECNs in accordance with EN DES-EP 4.02 before approval to determine if the changes should be included in a future UFSAR amendment.

# Design Project

 As part of the standard distribution, sends an information copy of all issued ECNs to POWER's Nuclear Licensing Staff relative to an UFSAR revision.

# Division of Nuclear Power

- 4. Prepares "as constructed" drawings by the configuration drawing control program described in EN DES-EP 4.16.
- Sends the revised "as constructed" drawings to the design project.

### Design Project

- Has the drawing reproduced and distributes copies of the drawings within OEDC.
- 7. Sends revised FSAR figures to NEB-NLS.

# NEB (Nuclear Licensing Section)

- 8. Coordinates with the Division of Nuclear Power in the determination of which ECNs will cover work completed by the cutoff date, which is 6 months prior to submittal of the amendment. Informs preparing organizations of this and of any other information which will aid in determining the changes to be covered in the UFSAR amendment.
- Provides the preparing organization as determined by the DOR with a copy of all material affecting UFSAR text; identifies to the extent possible the UFSAR sections affected.

SAFETY ANALYSIS REPORTS (AMENDMENTS AND REVISIONS) - PREPARATION, REVIEW, AND APPROVAL

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- 5.0 PREPARATION, REVIEW, AND APPROVAL OF AMENDMENTS AND REVISIONS (Continued)
  - 5.3 Review, Approval, and Records of Revision Material

Revision material prepared by OEDC is reviewed as described in subsection  $4.2.\,$ 

#### EXCEPTION

When the schedule for preparing revision material does not allow enough time for technical review, the preparing organization sends the material to NEB-NLS without completing the technical review. NEB-NLS sends unreviewed material to POWER's Nuclear Licensing Staff, noting its unreviewed status, for submittal to the NRC. The revision is reviewed after it is submitted to the NRC.

Amendment material that is prepared outside OEDC is reviewed as described in subsection 4.3.

Revision material is approved as described in subsections 4.2 and 4.3.

Records are documented as described in subsection 4.4.

### 6.0 REFERENCES

- 6.1 Title 10 of the Code of Federal Regulations Part 50 (10CFR50)
- 6.2 EN DES-EP 2.03, Unreviewed Safety Question Determination Handling and Preparation
- 6.3 EN DES-EP 2.07, Licensing Commitments Control and Tracking
- 6.4 EN DES-EP 4.02, Engineering Change Notices (ECNs) Handling
- 6.5 ANSI N45.2.11, Quality Assurance Requirements for the Design of Nuclear Power Plants
- 6.6 NRC Regulatory Guide 1.64, Quality Assurance Requirements for the Design of Nuclear Power Plants
- 6.7 NRC Regulatory Guide 10.1, Compilation of Reporting Requirements for Persons Subject to NRC Regulations

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# TENNESSEE VALLEY AUTHORITY

**Division of Engineering Design** 



# ENGINEERING PROCEDURE

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TITLE: \_\_\_\_\_AMENDMENTS TO SAFETY ANALYSIS REPORTS -

PREPARATION, REVIEW, AND APPROVAL

REVISION R5 RETIRES THIS EP. INFORMATION IN THIS EP IS SUPERSEDED BY EN DES-EP 2.01 R5.

ISSUE DATE: May 16, 1974

AFFECTS: Engineering Support Branches Architectural Support Branch Nuclear Projects Design Special Design Projects

Engineering Services Branch

|   |             | REVISION RO        | RI      | R2        | R3     | R4         | R5       |
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TVA 10534 (EN DES-4-78)

| AME            | ENDMENTS TO SAFETY ANALYSIS REPORTS - LEPARATION, REVIEW, AND APPROVAL  EN DE                                                                                                                |         |          |  |  |  |  |  |
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| Revision<br>No | DESCRIPTION OF REVISION                                                                                                                                                                      |         |          |  |  |  |  |  |
| 5              | This revision retires this EP. Information in this EP incorporated in EN DES-EP 2.01 R5. This action is a rear a recommendation of the EN DES-EP Subcommittee. Coordien DES is not required. | sult of | 12-29-83 |  |  |  |  |  |
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# TENNESSEE VALLEY AUTHORITY 206

Division of Engineering Design



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EN DES-EP \_\_\_\_\_\_ 2.05

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REPORTS IN A CURRENT STATUS

REVISION R1 RETIRES THIS EP. INFORMATION IN THIS EP IS SUPERSEDED BY EN DES-EP 2.01 R5.

ISSUE DATE: September 20, 1976

AFFECTS: Engineering Support Branches

Architectural Support Branch Nuclear Projects Design Special Design Projects Planning and Budget Branch

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|             | DATE 9/20/76                  | 12-29-83<br>C |    |    |             |         |
| PREPARED    | *EGB                          | Dry AVA       |    |    |             |         |
| SPONSORED   | *John A. Raulston             | JARL          |    |    | <u> </u>    |         |
| REVIEWED    |                               | **            |    |    | <del></del> |         |
| SUBMITTED   | *P. L. Duncan<br>*DBW for ILB | A D           |    |    |             |         |
| APPROVED    |                               | mis           |    |    |             | <u></u> |
| SER SVC CTR |                               | /             |    |    | <u> </u>    |         |

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\*\* Reviewed by PLD

TVA

TVA 10534 (EN DES-4-78)

MAINTENANCE OF FINAL SAFETY ANALYSIS

Title: REPORTS IN A CURRENT STATUS

EN DES-EP 2.05

| Revision<br>No. | DESCRIPTION OF REVISION                                                                                                                                                                                              |  |  |  |  |  |  |  |  |  |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|
| 1               | This revision retires this EP. Information in this EP has been incorporated in EN DES-EP 2.01 R5. This action is a result of a recommendation of the EN DES-EP Subcommittee. Coordination in EN DES is not required. |  |  |  |  |  |  |  |  |  |
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TENNESSEE VALLEY AUTHORITY

Division of Engineering Design

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# ENGINEERING PROCEDURE

EN DES-EP 4.02

ALL NUCLEAR UNITS BEFORE LICENSING

| TITLE: | ENGINEERING | CHANGE | NOTICES (ECNs) | BEFORE | LICENSING | - HANDLING |
|--------|-------------|--------|----------------|--------|-----------|------------|
|        |             |        |                |        |           |            |
|        |             |        |                |        |           |            |
|        |             |        |                |        |           |            |

ISSUE DATE: September 4, 1973

AFFECTS: -Husiage Projects Design

-Special Design Projects Discipline Branches

OTHERS NAMED

(FOR INFORMATION ONLY):

Division of Construction Division of Nuclear Power

Office of Quality Assurance

\*\*Revision R16 prepared by the EN DES Procedures Evaluation Team. **REVISION RO** R16 R17 R18 R19 **R20 DATE 9-4-73** 7-23-84 PREPARED E. A. Phillips\* SPONSORED J. W. Wilson\* REVIEWED P. L. Duncan\* SUBMITTED I. L. Burroughs\* APPROVED Roy H. Dunhem\*

TVA 10633 MEDS, WSR63 C-K \*Indicares NO signatures; R1-R15 initialed cover pages are in

PP history file.

| RING            | ENGINEERING CHANGE NOTICES (ECNo) BEFORE LICENSING - HANDLING EN DES-                                                                                                                                                |          |                 |  |  |  |  |  |  |
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| tevision<br>No. | DESCRIPTION OF REVISION                                                                                                                                                                                              | EN DES-E | Dete<br>Approve |  |  |  |  |  |  |
| 16              | This revision is issued to reflect discipline staffing. It is a product of the transition plan for procedures and instructions directed by R. W. Cantrell in PWP 840126 006; coordination in EN DES is not required. |          |                 |  |  |  |  |  |  |
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TVA 10534 (EN DES-4-78)

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Document No.: EN DES-EP 4.02

Title: Engineering Change Notices (ECNs) Before Licensing - Handling

Revision: 16 R-Denotes review A-Denotes approval

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# ENGINEERING CHANGE NOTICES (ECN.) BRFORE LICENSING - HANDLING

EN DES-EP 4.02

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# ENGINEERING CHANGE NOTICES (ECN.) BEFORE LICENSING - HANDLING

EN DES-EP 4.02

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ENGINEERING CHANGE NOTICES (ECNs) BEFORE LICENSING -HANDLING

EN DES-EP 4.02

# ABBREVIATIONS

- Computer Indexed System - Division of Construction CIS CONST Division of Construction DCD Design Criteria Diagram Design Change Request Engineering Change Notice DCR ECN EN DES Division of Engineering Design

FCR

Field Change Request Final Safety Analysis Report **FSAR** 

ID-QAP Interdivisional Quality Assurance Procedure

IJ Impact Justification ECN Issued After Licensing L-ECN

MEDS Management and Engineering Data Systems NCR

Nonconformance Report Nuclear Projects Design NDD

Nuclear Regulatory Commission NRC NUC PR - Division of Nuclear Power.

OL Operating License

OWIL

- Outstanding Work Items List - ECN Issued After Construction Project Manager P-ECN

Leaves Site

QA Quality Assurance

SAR - Safety Analysis Report

SDP

- Special Design Projects - Unreviewed Safety Question Determination USOD

# 1.0 PURPOSE

This procedure describes how the Engineering Change Notice (ECN) is initiated and processed before licensing and assigns responsibilities for its handling. The ECN is intended to provide EN DES and the Division of Construction (CONST) with a concise scope of a design change in a timely manner. It is not intended to be used as a substitute for routine communication and/or coordination within EN DES or with CONST. The ECN is a Quality Assurance (QA) record.

#### NOTE

After issuance of the Operating License (OL), ECNs are handled as in EN DES-EP 4.52.

# 2.0 SCOPE

The procedure defines the method to be used by angineering and architectural support branches, Nuclear Projects Design (NPD) projects, and Special Design Projects (SDP) to process design changes on nuclear plant drawings, including design criteria drawings, for which EN DES has full responsibility.

The procedure becomes effective for a project/plant when the Limited Work Authorization is issued. From that date, the procedure applies to all design changes initiated within EN DES after the original drawing issue (RO) and to modifications requested by CONST. This procedure also applies to new drawings which are required to accomplish nuclear plant design changes.

# 3.0 ECN FORMS: TITLE AND FUNCTIONS

- 3.1 ECN Cover Sheet (TVA 10575C) -- A form used to identify the ECN, show the initiator of the ECN, list the organizations involved with the ECN, and document the approval of the ECN. {See Figures 1 (10575C) and 2 (Key for Figure 1).} The scope section is used to show the project, affected units, and the system or feature affected by the change. The scope includes a brief description of and reason for the change and any applicable references. The description of the change should be stated concisely and in terms of the objective to be obtained.
- 3.2 ECN Cover Sheet Attachments (TVA 10575G, 10575H)--Sheets used for text or graphics to support the SCOPE section of the L-ECN or P-ECN cover sheet. [See Figures 3 (10575G), and 4 (10575H).]

# 3.0 ECN FORMS: TITLE AND FUNCTIONS (Continued)

- 3.3 ECN Data Sheet (TVA 10575A)—A sheet that shows the scope of a design section's work required for the ECN. The data sheet has a list of drawings and/or bills of material and/or FSAR text revisions to be revised or issued for the ECN. (See Figures 5, 6, and 7.)
- 3.4 ECN Data Sheet (TVA 10575E) -- A sheet used to continue the listing of drawings and/or bills of materials and/or FSAR text revisions from the first data sheet. (See Figure 6.)
- 3.5 ECN Closure Sheet (TVA 10575B)—A form used to notify CONST and other interested groups within TVA that no additional design drawings will be issued or requisitions released for the ECN being closed. (See Figure 8.)

# 4.0 ECN BEFORE ISSUANCE OF OPERATING LICENSE

4.1 Initial Submittal and Issue of ECN

# 4.1.1 Initiating ECN

When the standard ECN SI (see subsection 4.6) does not apply, approval of the change as in EN DES-EP 4.40 may be required. For plants under construction, Impact Justification (IJ) analysis is required for changes that significantly affect the scope or a schedule milestone or result in estimated total monetary increases, including the confidence factor, of more than \$500,000. Twelve months before the scheduled probable fuel loading of a unit, an IJ analysis is required for engineering changes that need additional cost or schedule information to proceed with the proposed change.

discipline sections

If the proposed change is identified by a suppost branch or SDP and an IJ analysis is not required, the suppost branch or SDP1 netities

discipline character prending information as needed) defining any change to design.

# NOTE

All correspondence about the ECN whether TVA- or vendor-originated must be traceable to the ECN and be recorded in the Management and Engineering Data Systems (MEDS) Computer Indexed System (CIS) (ref. EN DES-AI 901). After the ECN is issued, all TVA-originated correspondence related to the ECN must list the ECN number in the subject of the correspondence. All ECN forms will be entered in MEDS CIS when they are issued or reissued.

ENGINEERING CHANGE NOTICES (ECNs) BEFORE LICENSING - HANDLING

EN DES-EP 4.02

4.0 ECN BEFORE ISSUANCE OF OPERATING LICENSE (Continued)

4.1.1 Initiating ECN (Continued)

#### -NOTE

A memo is not required when the design change is covered entirely by the issuence of a design exiteria document (or revision) or a Design Input Name as in EN DES-EP 2.01.

If the standard ECN S1 does not apply (see (subsection 4.6),

recommends in the mane that the NPB project prepare an

ECN cover sheet (Figure 1) to process any changes to

drawings or bills of material. Includes any available
information (scope, involved organizations, technical data,
branch-prepared Nonconformance Report (NCR), etc.) that

branch-prepared Nonconformance Report (NCR), etc.] that will expedite preparation of the cover sheet.

The initiator of the proposed change will coordinate with the NPD project to establish and define any needed change to drawings or Design Criteria Diagrams (DCDs) resulting from changed criteria. The initiator will also prepare an NCR for a design error when one is required.

4.1.2 Cover Sheet
Instructor
NPD Project

1. When a needed change is identified, immediately prepares an ECN cover sheet (form TVA 10575C), regardless
of the status of the drawings; prepares the SCOPE,
obtains accigns an ECN number, and indicates whether an IJ
analysis was required (see Figure 1).

from the project management staff

An NCR (ref. EN DES-EP 1.26) must be processed when an issued design document must be changed to correct a significant or recurring condition which could have resulted in a required safety-related function not being fulfilled. This excludes changes for preplanned design development, improvement of an already satisfactory design, changes that are directed by new or revised standards or regulations, and non-safety-related changes.

# 4.0 ECN BEFORE ISSUANCE OF OPERATING LICENSE (Continued)

4.1.2 Cover Sheet (Continued)

In:hafor
NPD Project (Continued)

#### NOTE

The expected (normal time for completing the cover sheet is within 10 workdays after approval of the IJ forms, 2 or

direction completion of\_

when a suppose branch or SDP identifies a proposed design change by a mone, the NPD project will provide an early response by either disapproving the change or completing the cover sheet through step 9 or 12. The expected (normal) time for response is within 10 workdays after receipt of the memo. After coordination with the dairyn project manager.

2. Determines which support branches and NPP project groups and if SDP will need to submit new or revised drawings to implement the design change; marks "Yes" for each at DATA SHEETS REQUIRED.

# NOTE

discipline
If a support branch or SDP is involved in procurement only, they are not identified at DATA SHEETS REQUIRED.

- 3. If a Final Safety Analysis Report (FSAR) has been submitted to the Nuclear Regulatory Commission (NRC), determines which support branches will need to prepare a revision to the FSAR text as a result of the design change; marks "YES" for each at DATA SHEETS REQUIRED.
- 4. Adds attachments to the ECN as needed for review and approval by any approving support branches. (Prior approval of sketches by the support branch or project may be needed to expedite the support branch review.)
  - Names any applicable vendor(s) at VENDOR(S) INVOLVED; makes all YES-NO marks called for by the cover sheet.

discipline.

design.

When a support branch concurrence indicates the change is required, and with the approval of the appropriate NPD project manager, the ECN may be prepared while the 1J forms are being completed (ref. EN DES-EP 4.40).

#### ENGINEERING CHANGE NOTICES (ECNs) BEFORE LICENSING -HANDLING

EN DES-EP 4.02

- 4.0 ECN BEFORE ISSUANCE OF OPERATING LICENSE (Continued)
  - 4.1.2 Cover Sheet (Continued)

Instructor
NOD Project (Continued)

- 6. Marks the cover sheet to show any required design/ procurement/physical work milestones.
- 7. Signs the cover sheet through Project Engineer; forwards it to the NPB project manager. dosigni

Design NPD Project Manager

- other discipline For an ECN not requiring a suppost branch approval, continues with step 12.
- For an ECN requiring a suppost branch approval, signs on approval at "ECN IS READY FOR ENG BRANCH REVIEW."

  (Go to step 9.)

  DISCIPLINE

#### NOTE

As a minimum, approval of the ECN by a support branch is required if the ECN involves a change to a conceptual document | flow diagram, design criteria diagram, single line drawing, control and logic diagram, design criteria, equipment layout drawing (major equipment relocation), etc.] which affects a safety-related system. By mutual agreement, branches and projects may establish additional requirements for review and approval.

# NPB Project (EGN Glerk)

- 9. Forwards the ECN to the reviewing suppost branches. Discipline Reviewing Support Branchés)
  - 10. Review the ECN. (Safety Review/Technical Review)

# NOTE

discipline branch The expected (normal) review time for any cupport review branch is within seven workdays after receiving the **review** package.

the discipline branch chief(s) or his designee (s)

11. On approval, sign at Approved; return the cover sheet to the NPD project, management shaff.

# 4.0 ECN BEFORE ISSUANCE OF OPERATING LICENSE (Continued)

4.1.2 Cover Sheet (Continued)

# Desma HUS Project Manager

 Reviews the ECN; signs at RELEASED if he approves. (See NPD project manager's approvals at item c in Figure 2.)

# -NPD Project (EGN Clerk) Management Staff

- Issues the cover sheet (see Figure 2 for distribution list) (ref. EN DES-EP 1.14).
- 14. Files and maintains the cover sheet original; maintains the working file (original sheets) of all ECNs for the project.

# Involved Design Sections

- 15. Submit a data sheet as in subsection 4.1.3 within 15 working days of the cover sheet release date, unless another date is given at DATA SHEETS REQUIRED.
- 16. Cite the ECN by number in the revision block of all revisions to drawings and bills of material related to the ECN; cite the ECN by number on all appropriate memos.
- 17. When a drawing revision covers more than one ECN, circle each changed area and cite the related ECN with a leader line.
- 18. On new drawings made for the ECN, put the ECN number beside the title block and inside the drawing border.

#### Involved Procurement Sections

- Cite the ECN by number on applicable requisitions, memos, and vendor drawings.
- 4.1.3 Data Sheet (See Figure 5.)

#### Engineering or Design Section Supporting ECN

 Records the ECN number on the data sheet; fills out the SCOPE.

# 4.0 ECN BEFORE ISSUANCE OF OPERATING LICENSE (Continued)

4.1.3 Data Sheet (See Figure 5.) (Continued)

# Engineering or Design Section Supporting ECN (Continued)

- Lists new/revised TVA drawings required for the ECN on the back side of the data sheet as follows:
  - a. Lists drawings for which EN DES has full responsibility, including design and procurement drawings, DCDs, Architect-Engineer (A-E) drawings turned over to EN DES, and bills of material.
  - b. Lists a revision to an approved vendor drawing: (1) when it causes a revision to a TVA drawing(s), or (2) when it is used with a revised TVA drawing(s), or (3) when it is used by construction forces to install equipment.
  - c. Enters the vendor's contract number in the remarks column for each vendor drawing listed.

#### NOTE

If more than one sheet is needed to record the section's drawings, use copies of form TVA 10575E (see Figure 6); assign page number(s) beginning with 3.

- If an FSAR has been submitted to the NRC, lists any FSAR text revisions on the back of the data sheet.
- Leaves the DWG REV (Drawing Revision) column of the drawing list blank at initial issue of the data sheet. (This entry is made by the NPP project EGN clerk.) management staff.)
- Records in the prescribed block the number of pages of the initial issue (RO) of the data sheet.
- 6. If the data sheet is by a support branch or SDP:
  - a. Gets the data sheet reviewed and approved through Branch Chief/SDP Manager.
  - b. Sends the data sheet to the NPD project within 15 workdays after the NPD project manager releases the cover sheet.

- 4.0 ECN BEFORE ISSUANCE OF OPERATING LICENSE (Continued)
  - 4.1.3 Data Sheet (See Figure 5.) (Continued)

# Engineering or Design Section Supporting ECN (Continued)

- 7. If the data sheet is by an APP project group:
  - a. Gets the data sheet reviewed and approved through Croup Head. Project Engineer/Discipline Group Head.

# NPD Project (ECN Glerk) Management Staff

Assigns the data sheet an identifying number (1, 2, 3, . . .n) from a master file or log; fills in the top (address) part of the data sheet.

#### NOTE

discipline .

Data sheets for a given ECN are numbered consecutively. If an additional section in assupport branch becomes involved after initial numbering, its data sheet gets the next unused number.

- Gets a MEDS accession number stamped on the data sheet.
- 10. Obtains the NPP project manager's review and release signature; distributes copies to those listed on Figure 5, and others as necessary, within 10 workdays after the NPP project receives the data sheet.
- 11. Files the data sheet original.
- 12. Monitors receipt of the data sheets for each ECN; ensures attention to any that are late.
- 13. As drawings are issued against the ECN, records on the data sheet the revision level and issue date of each as a means of knowing when <u>all</u> the required drawings have been issued.

# 4.0 ECN BEFORE ISSUANCE OF OPERATING LICENSE (Continued)

4.1.3 Data Sheet (See Figure 5.) (Continued)

# Supporting Organizations

14. Maintain a record of the actual issue date of each drawing issued against the ECN to assist in closing the ECN as in subsection 4.5.

#### NOTE

The ISSUE DATE-ACTUAL on the data sheet may be used for this purpose (supporting organization's option).

### NPD Project Management Staff

15. At the time the ECN is closed, ensures that the data sheet with all actual issue dates is distributed to the construction forces.

# 4.2 Revising ECN Cover Sheet

Before an ECN is issued (released), any necessary change to the cover sheet is made by line-through corrections, initialed, and dated by the person responsible for reviewing or approving the change. Any significant revision (e.g., one that requires a change to the cover sheet SCOPE) must be reviewed by the

discipline -

section supervisor and project engineer, any project group or support branch submitting data sheets, and any involved discipline support branch chief.

After the cover sheet is issued, changes are handled by the preparer as follows:

- a. Lines through the correction in black ink; uses care to avoid obliterating the original entry; initials the correction.
- b. Notates "Revised (date) (NPP project manager's initials)" in the upper right-hand corner of the cover sheet.
- c. Stamps a new MEDS accession number on the cover sheet.
- d. Distributes the changed cover sheet the same as the original.

# 4.0 ECN BEFORE ISSUANCE OF OPERATING LICENSE (Continued)

# 4.2 Revising ECN Cover Sheet (Continued)

Any significant revision (e.g., a revision that would require changing the cover sheet SCOPE) of the design change after the ECN is issued requires voiding the ECN and/or issuing another.

After the cover sheet is issued (released), an organization may make a change in its implementing of the change by revising the SCOPE on its data sheet. Any such change, however, must remain consistent with the SCOPE on the cover sheet.

An ECN cover sheet listed as closed on a closure sheet (see subsection 4.5) cannot be revised.

# 4.3 Revising Data Sheet

Data Sheets are revised on the existing data sheet (see Figure 5) unless all the revision blocks have been previously filled. In this case, the existing data sheet is replaced by a modified data sheet (see Figure 7). In both cases, the restrictions and procedures for reissuing the data sheet are the same and are stated in subsections 4.3.1 through 4.3.4.

# 4.3.1 Marking Changes to Data Sheet

Observe the following to clearly mark changes to a data sheet:

- a. For each drawing line item added, deleted, or changed, record the data sheet revision number in the right-hand column of the drawing list.
- Any change to page 1 of the data sheet is flagged by an R-bar in the right-hand margin.
- c. If a drawing is issued more than once for an ECN, the originating section must list on the data sheet the drawing number again for each revision, but not the revision level (the NPD project SECN electron will list the revision level).

# 4.3.2 Changes to Data Sheet SCOPE Statement

An organization may make a change in implementing the ECN by revising the SCOPE on its data sheet. However, any such change must remain consistent with the SCOPE on the cover sheet.

# ENGINEERING CHANGE NOTICES (ECN.) BEFORE LICENSING - HANDLING

EN DES-EP 4.02

# 4.0 ECN BEFORE ISSUANCE OF OPERATING LICENSE (Continued)

# 4.3.3 Handling Change to NPD Project Data Sheet (Except SDP)

# Engineering or Daugn APP Section Supporting ECN

 Ensures that the data sheet original is revised as necessary; observes the restrictions in subsections 4.3.1 and 4.3.2.

#### -NPD Project

obtains

2. Reviews and, on approval, initials, the data sheet through Project Engineer (Group Head) / Discipline Group Head.

# Desma NPB Project Manager (or His Delegate)

Reviews and, on approval, initials and dates the revision.

# -NPD Project (ECN Clerk)

4. Reissues the data sheet.

# 4.3.4 Handling Change to Support Breach/SDP Data Sheet .

#### Preparer

 Marks the suppost branch or SDP copy of the data sheet to show the revision; observes the restrictions in subsections 4.3.1 and 4.3.2; initials the approval matrix.

# Support Branch/SDP

- Reviews and, on approval, initials the approval matrix through <u>Branch Chief</u>/SDP Manager.
- 3. Forwards the marked and approved copy of the data sheet to the NPD project, management staff.

# NPD Project (BON Clerk) Management Staff

Transfers all change marks (including support branches SDP initials) to the original data sheet; initials the signout matrix on the original.

# 4.0 ECN BEFORE ISSUANCE OF OPERATING LICENSE (Continued)

4.3.4 Handling Change to Support Broach/SDP Data Sheet (Continued) Management Staff NPD Project (EGN Clerk) (Continued)

5. At the project's option, discards or retains the support branch's or SDP's marked copy.

# NPD Project Manager (or Nie Delegate)

obtains the project moneger's
Reviews and, on approval, initials the signout matrix of the original data sheet.

#### NPB Project (EGN Glerk)

Reissues the data sheet, including a copy to the support branch or SDP that submitted it.

### Support Branch/SDP

-8. Files the reissued copy.

#### 4.4 Voiding ECN

Before voiding an ECN, the NPD project, management staff:

- Determines whether drawings have been issued, the FSAR has been modified, or if the design work is progressing on the change to be voided.
- 2. Notifies all support branches who reviewed and approved the ECN and requests technical comments on the plans to void the ECN.
- If there are no safety or technical reasons why the ECN cannot be voided/ the NPD project;
  - Marks the cover sheet "VOID" in bold letters across the SCOPE.
  - Gets any necessary dated coordinating initials from the involved project groups and/or support branches.

    design discipline.
  - design discipline.

    Obtains the NPD project manager's approval initials.
  - d. Distributes copies (include MEDS CIS).
  - e. Files the original voided cover sheet.

ENGINEERING CHANGE NOTICES (ECNs) BEFORE LICENSING -HANDLING

EN DES-EP 4.02

- 4.0 ECN BEFORE ISSUANCE OF OPERATING LICENSE (Continued)
  - Voiding ECN (Continued)

# NOTE

An ECN may not be voided until (1) all drawings issued under an ECN have been revised and reissued to retract the changes resulting from the voided ECN (i.e., to void the ECN, the drawings issued under the ECN must be returned to their pre-ECN condition before reissuing the drawings--no new ECN is required) and (2) the Nuclear Licensing Section of the Nuclear Engineering Support Branch has been instructed by any support discipline branches which provided FSAR revisions to modify the FSAR accordingly. If an ECN is in progress but no longer required, return the drawings to their original condition.

Closing Design Work for ECN (See Figure 8.)

discipline -

When WPD project records (plus any needed project) inquiry among involved support branches or SDP) show that all drawings on all data sheets for an ECN are issued, the NPD project lists the ECN on a closure sheet. If required by a data sheet, text revisions to the FSAR must be prepared (ref. EN DES-EP 2.01) reviewed, and submitted to the Nuclear Licensing Section of the Nuclear Engineering Support Branch prior to EN DES reporting that design work is complete on an ECN. (The supportabranch chief responsible for preparing the revision to the FSAR text verifies this requirement has been met when he initials the closure sheet.) One or more ECNs may be listed on a closure sheet. The closure sheet is initialed by the chiefe of the responsible support branches, the project manager of SDP, and the NPD project group beads that submitted data sheets for the ECN(s) being closed.

persons within organization

management staff The NPD project numbers the closure sheets consecutively starting with 1, gets the NPD project manager's signature, distributes copies of the closure sheet (see Figure 8 for distribution), and sends the original to MEDS CIS. Before a closure sheet is issued, corrections may be made by line-through in ink. These corrections must be initialed and dated by the individual responsible for approving or reviewing the change. An issued closure sheet may not be revised or voided.

# 4.0 ECN BEFORE ISSUANCE OF OPERATING LICENSE (Continued)

# 4.6 ECN S1 Change

# 4.6.1 ECN S1 Defined

Under the conditions specified in subsection 4.6.2, the responsible section supervisor may elect to change drawings without preparing and processing an ECN. Such a change is called an "ECN S1 change," and does not require an IJ analysis (ref. EN DES-EP 4.40). An ECN S1 is handled as follows:

- a. After determining that the change meets the conditions in subsection 4.6.2, make the required changes to the affected drawing.
- Enter "S1" at ECN NO. on the revision block of the affected drawing.
- c. Circle all changes to the drawing.

# 4.6.2 ECN S1 Allowed

#### NOTE

A minor revision is one that: (a) does not affect system functional performance nor design interfaces, (b) does not impact CONST's construction schedule, and (c) does not impact EN DES's design schedule.

An ECN S1 change may be used only for minor changes and when:

a. The change involves only one NPD section, or one support branch section, or

<sup>3
4.</sup> Refer to the EN DES Project Control User's Manual.

under the same discipline project engineer:

There are three specific exceptions which are allowed. These all involve drawings in the same discipline where all items are the responsibility of no more than two sections within the same group in the design preject. (1) a piping drawing, a support drawing, and associated calculations for the purpose of changing the design of a support as requested by an FCR; (2) a concrete drawing and a steel (main or miscellaneous) drawing for the purpose of changing anchor bolting as requested by an FCR; and (3) a schematic drawing, a connection drawing, and a cable drawing for the purpose of implementing a minor change as requested by an FCR.

# 4.0 ECN BEFORE ISSUANCE OF OPERATING LICENSE (Continued)

# 4.6.2 ECN S1 Allowed (Continued)

- b. The change involves procurement by a suppost branch not involved in the design, or
- c. The change is to a conceptual document generated in a discipline supposes branch for one of the following purposes:
  - (1) A change to make very minor editorial corrections, such as spelling, or
  - A change to add the Unique Identification (UNID) code only.
  - d. The change is to incorporate approved FCRs and meets the requirements of 4.6.2a.

### 4.6.3 ECN S1 Disallowed

The ECN S1 may not be used when:

- The change would result in a revision to: (1) the SAR document, (2) SAR drawings, (3) system performance, (4) design interfaces, (5) approved vendor drawings, (6) preoperational testing, (7) fuel loading date, or
  - (8) unit operation, or (9) requires backcharges, or
- b. There is doubt about whether another section, another EN DES organization, or CONST should be notified of the change, or

# c. The change would require physical work by CONST after a date agreed to by the NPD and the CONST project manager or after the issuance of the OL, or

- The affected unit is licensed for operation (refer to EN DES-EP 4.52), or
- e. The analyses (seismic, pipe break, thermal hydraulic, pressure drop, fluid flow, etc.) performed outside the group is affected, or

Vendor drawings turned over to TVA for revision responsibility are treated as TVA drawings.

<sup>1.</sup> See footnote 7.

- 4.0 ECN BEFORE ISSUANCE OF OPERATING LICENSE (Continued)
  - 4.6.3 ECN S1 Disallowed (Continued)
    - f. The control logic and/or monitoring of safety-related features is affected.

"The support branches normally do not use the ECN CL.

4.6.4 Monthly Review of ECN S1 Changes

design

discipline

Each\_Aproject manager shall provide to the suppost branches for review a monthly Drawing Information System (DIS)/Drawing Management System (DMS) tabulation that identifies the drawing number and revision level of each ECN S1 change. A copy of each monthly tabulation for each project shall be sent to the Design Quality Assurance Branch in the Office of Quality Assurance.

- 5.0 ECN IN TIME PERIOD "JUST PRIOR TO" ISSUANCE OF OPERATING LICENSE
  - 5.1 Initial Su mittal and Issue of ECN
  - 5.1.1 Initiating ECN

If an ECN S1 (subsection 4.6) does not apply, and in the case where the design and/or physical work will be initiated before the issuance of the OL but may not be completed until after receipt of the OL, an ECN cover sheet (form TVA 10575C) is used.\* The ECN is initiated as in subsection 4.1.1.

Any ECN issued after receipt of the QL is handled as an L-ECN or a P-ECN (ref. EN DES-EP 4.52).

In some cases, the NPD project may prefer that the physical work implementation of a design change be started after NRC issuance of the OL. As a procedural option to subsection 5.1, the NPD project may prepare an L-ECN for the unit involved (ref. EN DES-EP 4.52). However, the Unreviewed Safety Question Determination (USQD) certification required on the L-ECN Cover Sheet shall not be issued until after issuance of the OL. Therefore, the L-ECN cannot be issued until after issuance of the OL, but the design work may be accomplished prior to issuance of the OL. If this procedural option is chosen, the L-ECN cover sheet will be handled as in EN DES-EP 4.52.

# ENGINEERING CHANGE NOTICES (ECN#) BEFORE LICENSING -

EN DES-EP 4.02

- 5.0 ECN IN TIME PERIOD "JUST PRIOR TO" ISSUANCE OF OPERATING LICENSE (Continued)
  - 5.1.2 Cover Sheet

The cover sheet is handled as in subsection 4.1.2.

5.1.3 Data Sheet

The data sheet is handled as in subsection 4.1.3.

5.2 Revising ECN Cover Sheet and Data Sheet

Revisions to the cover sheet and data sheet issued just prior to issuance of the OL are handled as in subsections 4.2 and 4.3, respectively.

- 5.3 ECNs Not Completed Prior to Licensing

  Design

  NPD Project
  - Reviews the Outstanding Work Items List (OWIL) to ensure that all ECNs not completed by EN DES before the OL is issued are included.
  - Notifies by memo the Nuclear Engineering Support Branch and the Division of Nuclear Power of any incomplete ECNs (ECNs should be cross-referenced to the OWIL item identification number) and that USQDs will be required for implementation or completion of physical work.

### Nuclear Engineering Support Branch

 On notice from the NUC PR Outage Director (or his designee), writes a USQD against the OWIL item (ref. EN DES-EP 2.03); provides the NPP project with a reproducible copy.

<sup>9.</sup> ID-QAP-1.3 provides a description of the OWIL and defines the responsibilities and functions of EN DES, CONST, and NUC PR for controlling work on unlicensed units. ID-QAP-6.2 describes the OWIL and the procedure for headling the OWIL. ID-QAPs 1.2, 2.2, and 2.4 address related subjects.

- 5.0 ECN IN TIME PERIOD "JUST PRIOR TO" ISSUANCE OF OPERATING LICENSE (Continued)
  - 5.3 ECNs Not Completed Prior to Licensing (Continued)

    Danger WPD Project
    - Retrieves the original ECN cover sheet and stamps it with the following:

"OL issued before completion of ECN work; ECN work included in OWIL as item No.

 Stamps the reissued ECN cover sheet and the RO issue of the USQD with the same MEDS accession number; redistributes (including to MEDS CIS) the ECN Cover Sheet with the USQD attached.

#### NOTE

Subsequent revisions to USQDs are distributed without the ECN cover sheet and are sent to MEDS CIS as separate documents (ref. EN DES-EP 2.03).

### 5.4 Voiding ECN

Voiding an ECN issued just prior to issuance of the OL is handled as in subsection 4.4, except the NPD project will request that a USQD continuation be performed to determine if there is any safety impact on other approved ECNs (ref. EN DES-EP 2.03).

5.5 Closing Design Work for ECN

Closing design work for the ECN issued just prior to issuance of the OL is handled as in subsection 4.5.

# NOTE

Closing of the design work may be accomplished before or after issuance of the OL, but the ECN must have been issued prior to issuance of the OL.

5.6 ECN S1 Change

The ECN S1 may be used anytime before the OL is issued and all restrictions and handling instructions in subsection 4.6 are applicable.

#### 6.0 EXEMPTIONS

# 6.1 Future Nuclear Plants

This procedure is effective for all nuclear projects when the Limited Work Authorization is issued. At that time, the design project organization will compile a "base list" of all drawings issued for the project prior to the Limited Work Authorization, showing for each the drawing number, latest revision level, title, and issue date. This list will be the basis for EN DES design change control as required by ANSI N45.2.11-1974, Paragraph 8. All drawings issued or revised after the base list is established shall be in accordance with this procedure.

During the period between the disbanding of the EN DES task force and the issuing of the Limited Work Authorization, any drawing change that affects safety-related systems or cupper disciple branch(es) conceptual documents is coordinated with the cupper disciple branch(es) and documented by the cupper branch or have project initiating the change. Documentation is by use of a numbered design control memo or a Design Input Memo, as applicable.

Design control memos will be numbered, issued, and monitored by

design \_\_\_\_

# 6.2 Major Additions

the NPD project.

New (RO) drawings resulting from the addition of a major system or facility (cooling towers, radwaste buildings, etc.) to a nuclear plant under construction will be issued without an ECN.

The NPP project manager will release a memo describing the addition and the required completion date.

Any revisions to existing drawings and any change to the original scope of the addition will be handled through the established ECN procedure.

# 6.3 Original Drawing Issue

An ECN change may be incorporated in the original issue of a previously scheduled drawing without a cross-reference between the drawing and the ECN. No reference to the ECN will be made on the RO drawing, and the drawing will not be listed on an ECN data sheet. RO drawings issued solely to satisfy a change covered by an ECN will be handled according to the usual ECN procedure.

#### 6.0 EXEMPTIONS (Continued)

6.4 Revisions to Design Criteria Diagrams (DCDs)

A revision to a DCD may require an accompanying ECN (ref. EN DES-EP 3.09).

Any required change to a DCD must be completed within a year after issue of the associated ECN.

6.5 Revisions to Design Criteria Documents

A revision to a Design Criteria Document which results in a drawing change, requires that an ECN (ref. EN DES-EP 3.01) be prepared as in this procedure.

# 7.0 REFERENCES

- 7.1 EN DES-AI 901, -IN- CORRESPONDENCE
- 7.2 EN DES-EP 1.14, Engineering Records Retention and Storage
- 7.3 EN DES-EP 1.26, Nonconformances Reporting and Handling by EN DES
- 7.4 EN DES-EP 2.01, Safety Analysis Reports (Amendments and Revisions) Preparation, Review, and Approval
- 7.5 EN DES-EP 2.03, Unreviewed Safety Question Determination Handling and Preparation
- 7.6 EN DES-EP 3.01, Design Criteria Documents Preparation, Review, and Approval
- 7.7 EN DES-EP-3.02, Science Design, Review, and Control
- 7.8 EN DES-EP 3.09, Design Criteria Diagrams for Fluid Systems Preparation, Review, and Approval
- 7.9 EN DES-EP 3.36, Operator Interface Design Changes, Review, and Control
- 7.10 EN DES-EP 3.42, Engineering Evaluation of the Effects of Postulated Pipe Rupture Work Flow and Responsibilities
- -7.11 EN DES-EP-4.24, Numbering of Design Drawings-

EN DES-EP 4.02

# 7.0 REFERENCES (Continued)

Analysis

- 7.12 EN DES-EP 4.40, Engineering Change and Impact Justification A
- 7.13 EN DES-EP 4.46, Security Considerations Handling and Coordination
- 7.14 EN DES-EP 4.52, Engineering Change Notices (ECNs) After Licensing Handling
- 7.15 ID-QAP-1.2, Transfer of Construction and Engineering Design Responsibilities— OEDC. to POWER
- 7.16 ID-QAP-1.3, Work Control
- 7.17 ID-QAP-2.2, EN DES-NUC PR-CONST Interfaces and Responsibilities During and Following Transition from Design and Construction to Operation
- Control of
  7.18 ID-QAP-2.4, Future Modification
- 7.19 ID-QAD-6.2, Proposition, Maintenance, and Distribution of the Outstanding Work Items List (CWIL)

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NOTES: 1. NED project to responsible for all entries.

X. All entries and signatures to be made in black ink.

Figure 1. ECN Cover Sheet 10575C for Use BEFORE Issuance of Operating License (See Figure 2 for Key and Distribution)

ENGINEERING CHANGE NOTICES (ECN.) BEFORE LICENSING -HANDLING

EN DES-EP 4.02

KEY

a. By the NPP project ECN clerk; normally 1, 2, 3, . . . n for a project.

(When this number sequence is impractical, use x001, x002, x003,

. . . x00n, where x is a digit chosen by the project.) The NPP daugh

project, support branches, and SDP use this number for a given change.

If an IJ was required, the ECN number will be the same as the number on the IJ.

- b. An IJ is required for changes that significantly affect the scope or a schedule milestone, or result in estimated total monetary increases, including the confidence factor, of more than \$500,000. Twelve months before the scheduled probable fuel loading of a unit, an IJ analysis is required for engineering changes that need additional cost or schedule information to proceed with the proposed change (ref. EN DES-EP 4.40).
- c. Release by the NPD project manager includes epproval of: (1) the change, based on the design criteria, SAR, and/or other controlling documents the information on the cover sheet (scope of review, physical work that must be completed by, etc.); (2) costs and changes to the schedules for design and constructions to the schedules for design and constructions and (2) his approval of the schedules for design and procurement work to proceed.
- d. If the ECN effects a change to only one unit, indicate "1" or "2"; if the change applies to both units, show "1 and 2."
- e. Record a brief description of and the reason for the change, and any applicable references. The SCOPE section includes a brief description of and reason for the change and any applicable references. The description of the change should be stated concisely and in terms of the objective to be obtained. Use cover sheet attachments (see Figures 3 and 4 in EN DES-EP 4.02) if more space is needed.
- f. Supervisor initiating the cover sheet confirms involvement of suppost branches/NPD project groups/SDP by coordinating the ECN before it is issued. Answer "Yes" only when the indicated organization will submit a data sheet to list new or revised drawings required for the change, or to list FSAR text revisions required due to the change. A separate data sheet will not be required of a suppose branch having procurement action only.

Figure 2. Key and Distribution List for Figure 1 (Sheet 1 of 3)

EN DES-EP 4.02

- g. Data sheets are due from every involved suppost branch/NPD project—group/SDP within 15 workdays after the NPD project manager releases the cover sheet. Record a date here only if the suppost branch/NPD-project group/SDP cannot supply a data sheet within 15 days and explain the delay under SCOPE.
- h. "Yes" if, as a minimum, the ECN requires change in a conceptual document [flow diagram, design criteria diagram, single line drawing, control and logic diagram, design criteria, equipment layout drawing (major equipment relocation), etc.] which affects a safety-related system. By mutual agreement, branches and projects may establish additional requirements for review and approval.
- i. If h is "Yes," the cover sheet originator determines which support branch(es) needs to review and approve the ECN based on the conditions set forth in h. If the ECN does not affect a support branch, he enters "N/A" and his initials to indicate a suppost branch approval signature is not needed.
- j. "Yes" only if the change is required: (1) to provide information needed for the initial FSAR submittal, (2) to provide information specifically requested by NRC to be included in the PSAR or FSAR, or (3) to be implemented quickly to meet licensing schedules. After the construction permit is issued but before the FSAR is issued, an SAR change (ref. EN DES-EP 2.01) is generally not required by a design change unless basic criteria have been changed.
- k. "Yes" only if the related preoperational test scoping documents and/or test instructions are issued and the change is required:
  (1) to facilitate testing, (2) to correct deficiencies discovered in testing or remove a condition which is preventing testing, or
  (3) to be implemented quickly to support the test schedule.
- "Yes" if EN DES believes the ECN involves an error for which the vendor is liable. If "Yes," CONST initiates the backcharge procedure, including accounting for labor/materials costs.
- m. "Yes-I" if the ECN involves the primary safety functions that could adversely affect a safety-related system of a Category I structure, device, or component being installed or modified. If the ECN involves the secondary safety functions that could adversely affect a safetyrelated system of a Category I(L) structure, device, or component being installed or modified, enter "Yes-I(L)." If the ECN involves both, enter "Yes-I & I(L)."
- n. "Yes" if an NCR related to the design change must be prepared. (See footnote on NCRs in section 4.0 of EN DES-EP-4.02.)

Figure 2. Key and Distribution List for Figure 1 (Sheet 2 of 3)

EN DES-EP 4.02

- o. "Yes" if the ECN is safety-related. If the ECN involves a <u>limited QA</u> program (e.g., fire protection, radwaste), enter "Yes\*" and show by footnote the type of limited QA program.
- p. If "Yes," send a copy of the ECN cover sheet and data sheets to the Architectural Support Branch. (Ref. EN DES-EP 4.46).
- q. "Yes" if the change affects the operation or environment of the main control room or auxiliary (backup) control room (ref. EN DES-EP-3.36).
- r. "Yes" if the ECN involves high-energy piping or safety-related systems in areas containing any fluid piping (ref. EN DES-EP-3.42). Mark "Yes" if any doubt exists.
- s. Enter the first milestone for which some or all physical work (design/procurement if no physical work is required) must be completed. EN DES is responsible for determining (ref. ID-QAP-2.2) and identifying (ref. ID-QAP-2.4) physical work that must be done before initial fuel loading. An entry at "1st Fuel Load" is necessary to identify a design change for such work.
- t. Specify any other events (e.g., hot functional test) for which the physical work must be effective. Put an asterisk (\*) in the block and footnote the event below the matrix.
- u. Denotes the number of attachments (memos, sketches, safety review, etc.) other than data sheets.

#### DISTRIBUTION

ECN cover sheets are distributed as follows:

Plant Superintendent Chief, Cost Planning and Control Staff, W12C74 C-K Manager of Construction, E7B24 C-K MEDS, W5B63 C-K

ECN cover sheets must also be distributed to any of the following who are required to submit data sheets and/or review the ECN:

Chief, Civil Engineering Support Branch Chief, Electrical Engineering Support Branch Chief, Mechanical Engineering Support Branch Chief Nuclear Engineer Chief, Architectural Support Branch Project Manager, Special Design Projects

Figure 2. Key and Distribution List for Figure 1 (Sheet 3 of 3)

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|                                                                                            |                     | • This sheet is for<br>text supporting the ECN Cover Sheet's<br>Scope section. |
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Figure 3. ECN Cover Sheet Attachment for Text, Form TVA 10575G

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 This sheet is for graphics supporting the ECN Cover Sheet's SCOPE section.

Figure 4. ECN Cover Sheet Attachment for Graphics, Form TVA 10575H

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| 3. 19540 SARE SARV HAAD CORP DIRECTORS. SECURITION IN CORP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | D. 1994D SAREC SUPY HEAD CORP CLERK SIGN.  9 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |      |   |                |            |               |          |               |                 |                                               |                         | Trava       |
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| nju Manaraja se felikom                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            | _    |   | <u></u>        | _          |               |          | •             |                 |                                               |                         |             |

, management Staff NOTES:
1. Entries marked "\*" to be made by NPP project; all other entries by preparing organization.
2. All entries and signatures to be made in black ink.

Figure 5. ECN Data Sheet, Form TVA 10575A (Front Side) (Sheet 1 of 2) (See Sheet 2 for Key and Distribution)

# ENGINEERING CHANGE NOTICES (ECHo) REFORE LICENSING -

EN DES-EP 4.02

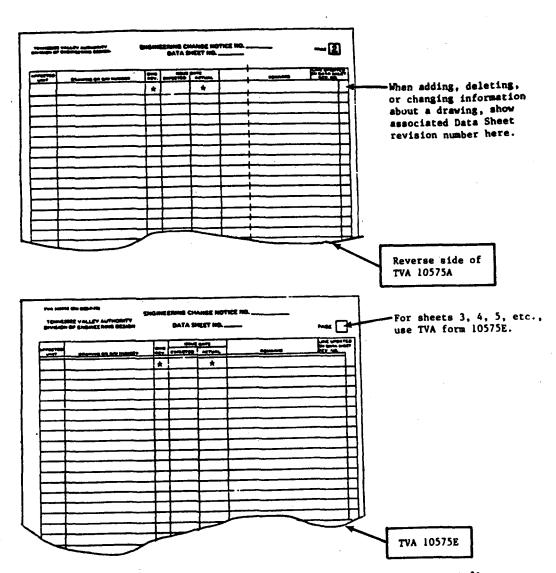
#### KEY

- a. Include the number of the parent ECN.
- b. Address the data sheet to the CONST Project Manager
- c. Record the MEDS accession number in the appropriate block for RO through R7.
- d. Even though this SCOPE may vary from the SCOPE in the ECN cover sheet, ensure that is consistent with the ECN cover sheet SCOPE.
- e. If the ECM effects a change to only one unit, indicate "1" or "2;" if the change applies to both units, show "1 and 2."
- f. If the ECM originator shows on the cover sheet that your branch/project-group is involved, prepare a data sheet. If your branch/project group-determines that they are not involved, print NOT INVOLVED as shown.
- g. Complete the signout and description block for the appropriate revision.

# DISTRIBUTION (Minimum; others as necessary)

Originating Section Plant Superintendent MEDS, W5B63 C-K

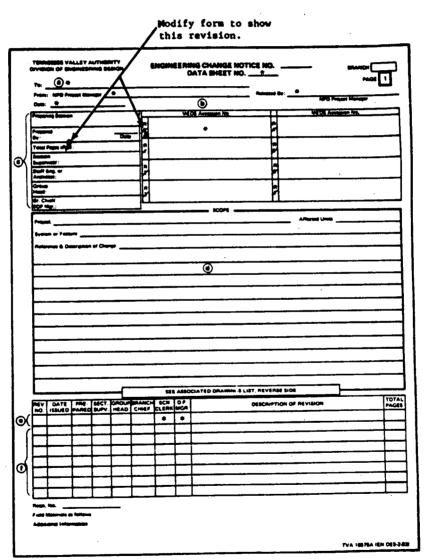
Figure 5. ECN Data Sheet, Form TVA 10575A (Front Side - Key and Distribution) (Sheet 2 of 2)



NOTES: 1. Entries marked "\*" to be made by NPB Project management staff. all other entries by preparing organization.

2. All entries and signatures to be made in black ink.

Figure 6. ECN Data Sheet Forms TVA 10575A (Back Side) and TVA 10575E



NOTES: 1. Entries marked "\*" to be made by NPD-project; all other entries by preparing organization. - management slaff

- 2. All entries and signatures to be made in black ink.
- 3. Recopy drawing list; use back of form and additional forms if needed.

Figure 7. ECN Data Sheet Revision Requiring Replacement of Original Data Sheet, Form TVA 10575A (Sheet 1 of 2) (See Sheet 2 for Key)

# ENGINEERING CHANGE NOTICES (ECN.) BEFORE LICENSING - HANDLING

EN DES-EP 4.02

#### KEY

- a. Address the data sheet to the CONST Project Manager
- b. Record the MEDS accession number of the RO issue shown on the previous data sheet. Example: RO BLP 800206 003.
- c. Ensure that signatures match approval initials for this revision.
- d. Copy from previous data sheet (unless revised).
- e. Show the revision with approvals and description here.
- f. Use these lines to show next (up to seven) revisions here.

DISTRIBUTION (Minimum; others as necessary)

Originating Section Plant Superintendent MEDS, W5B63 C-K

Figure 7. ECN Data Sheet Revision Requiring Replacement of Original Data Sheet, Form TVA 10575A (Sheet 2 of 2 - Key)

| ENGINEERING CHANGE NOTICE CLOSURE SHEET                                                                                     | Each project numbers<br>their closure sheets<br>1, 2, 3 n.                                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TEAMMERSEE VALLEY AUTHORITY DIVISION OF ENGINEERMING DESIGN  To: Construction Project Manager                               |                                                                                                                                                                |
| Process IAPO Project Manager  DATE:                                                                                         | Quantity of ECNs being closed out.                                                                                                                             |
| 24                                                                                                                          | Corrections may be made<br>by lining through in<br>ink, and must be signed<br>and dated by the person<br>responsible for reviewing<br>or approving the change. |
|                                                                                                                             | NOTE  After issue, a closure sheet may not be revised or voided.                                                                                               |
| SUPPORT ERANCHES NUCLEAR PROJECTS AND SOP DESIGN GROUPS  Crus Coul Groc Groc Mach Mach Mach Mach                            | Only the supports branches or SDP, or MBD project—groupe that submitted Data Sheets are required to initial.                                                   |
| The management staff  TES: 1. WP project is responsible for all entries.  2. All entries and signatures to be made in black | Denotes the number of attachments (memos sketches, etc.) other than Data Sheets.                                                                               |

Figure 8. ECN Closure Sheet, Form TVA 10575B

Chief, Special Design Projects

Manager of Construction Chief, Cost Planning and Control Staff MEDS, W5B63 C-K

DISTRIBUTION (Minimum; others as necessary)

Chief, Architectural Support Branch Chief, Civil Engineering Support Branch Chief, Electrical Engineering Support Branch Chief, Mechanical Engineering Support Branch Chief Nuclear Engineer

#### **EVALUATION SHEET**

Rev. Date 12/27/83

Task Force Category 5 for Watts Bar Nuclear Plant - Unit 1

2. Task Force Category Description and Related B&V Findings:

Procurement forms and flow diagrams specified different requirements for various valves: 1) F308, F314, F328, F894, F895, F896, F897; 2) F307; 3) F335, F336.

#### 3. Evaluation for Cause

A. Preliminary - 1) F308, F314, F328, F894, F895, F896, F897 - The design change process requirements apparently did not require that a review of the adequacy of previous procurements be made and documented when design conditions were revised. 2) F307 - The drawing preparation process apparently lacks a definitive policy on the manner of presenting design and operating conditions on isometric and flow diagrams. 3) F335, F336 - The component qualification process results were not required to be simultaneously tied to the design process and procurement process.

B. Final - 1) and 2) Our normal squadcheck and ECN process requires a review of all items affected by a design change for adequacy. Our flow and isometric diagrams list piping classifications and not actual operating pressure and temperature. Design conditions for the valves are calculated using operating temperatures and pressures. It was never intended that the valves be specified to flow diagram data. Also, misuse of the S1 ECN may have contributed to the discrepancies. 3) As above.

Resp. Org. 9 RB sleer / 19184 Task Force Concurrence

## 4. Evaluation for Generic Examples

Preliminary - The generic examples could be identified by: 1) F308, F314, F328, F894, F895, F896, F897 - Review all safety related EEB procured valves where system design pressure/temperature conditions have changed since procurements to verify consistency of procurement documentation. 2) F307 - A review of all interfaces of low pressure, normally idle systems with high pressure normally operating systems for the adequate presentation of design and operating conditions. 3) F335, F336 - The examples noted by B&V represented slow documentation of qualification rather than nonperformance of the qualification. Since this was ongoing incomplete work there is no need to identify generic examples. (However, the program control does need some improvement - see 10A.)

Final - 1) All EEB procured valves were compared to new design pressure/ temperature conditions using ANSI class rating and no discrepancies were found. 2) A review of all interfaces was performed and no discrepancies were found.

3) As above.

Resp. Org. MR Beleve 1/9/84 Task Force Concurrence 2/19/84

| 5. | Licensing | Basis | Satisfaction |
|----|-----------|-------|--------------|
|----|-----------|-------|--------------|

- A. Preliminary
  - 1) and 2) All examples identified thusfar are acceptable to use-as-is. However, both types of problem have the potential for resulting in a failure to meet the licensing basis. Therefore, this determination can not be made until the generic examples are identified. 3) N/A This work was in progress.
- B. Final
  - 1) and 2) All valves and interfaces were checked and found to satisfy the licensing basis. 3) N/A

Resp. Org. M R Belur 1/9/84 Task Force Concurrence 119/84

- 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work
  - A. Preliminary
    - 1) and 2) WBNEEB 8207 and ECN 3511 address the B&V findings with the following exceptions: F308 and F314. The Task Force is not aware of any corrective actions yet specified.
  - B. Final

N/A

Resp. Org. M R Below 1/9/84 Task Force Concurrence Loffen 1/9/84

- 7A. Identification of Corrective Action for Completed Work
  - A. Preliminary
    - 1) The generic deviations identified in 4 should be requalified to the current design conditions. 2) The flow diagrams should be revised to accurately and consistently present the design information. 3) N/A No deviations in completed work were substantiated.
  - B. Final

N/A

Resp. Org. MR Belew 1 19 184 Task Force Concurrence Islam 119184

| . Preliminary                                                             |
|---------------------------------------------------------------------------|
|                                                                           |
|                                                                           |
| • Final                                                                   |
| N/A                                                                       |
|                                                                           |
| esp. Org. M R Below 1/9/84 Task Force Concurrence Iffer 1/9/8             |
| dentification and Evaluation of Ongoing Corrective Action for Future Work |
| • Preliminary                                                             |
| 1), 2), and 3) Task Force is not aware of any action.                     |
|                                                                           |

8A. Implementation and Inspection of Corrective Action for Completed Work

10A. Identification of Corrective Action for Future Work

N/A

A. Preliminary
1) Policy needs to be established for positive reassessment of procurement
affected by design changes. 2) Drawing presentation of design conditions needs
to be better specified. 3) The process of requalifying components whose seismic
accelerations are analyzed to exceed procurement specifications needs to be
formalized and included in the EP system.

Resp. Org. MR Below 1/9/84 Task Force Concurrence

B. Final
The engineering procedures in place (ECN, squadchecking, signature, further review) are adequate to prevent recurrence. EP 4.02 has been revised and a memorandum issued by management, controlling the use of the Sl ECN. EP 5.06 has been issued (5-27-80) to control preparation and review of specifications. Together these steps should avoid the concerns identified in step 3A.

Resp. Org. M R Below / 19184 Task Force Concurrence 2/1/20 19184

| IIA. | Implementation of Corrective Action for Future Work                                                            |
|------|----------------------------------------------------------------------------------------------------------------|
|      | A. Preliminary                                                                                                 |
|      |                                                                                                                |
|      |                                                                                                                |
|      |                                                                                                                |
|      | B. Final                                                                                                       |
|      |                                                                                                                |
|      | Corrections identified in 10A.B are in place.                                                                  |
|      |                                                                                                                |
|      |                                                                                                                |
|      | Resp. Org. MR Below 1/9/84 Task Force Concurrence 2/19/84                                                      |
| 12A. | Verification of Effectiveness of Corrective Action for Future Work                                             |
|      | A. Preliminary                                                                                                 |
|      |                                                                                                                |
|      |                                                                                                                |
|      |                                                                                                                |
|      | B. Final                                                                                                       |
|      | The basis for QMS closure of this category evaluation sheet is noted in                                        |
|      | J. W. von Weisenstein's memorandum to Quality Management Staff Files dated November 26, 1984 (QMS 841126 201). |
|      |                                                                                                                |
|      | Resp. Organia 12 131/84  Task Force Concurrence If the 12 131/84                                               |
|      |                                                                                                                |
| 6B.  | Identification and Evaluation of Ongoing Corrective Action for Completed Work                                  |
|      | A. Preliminary                                                                                                 |
|      | N/A                                                                                                            |
|      | <del></del>                                                                                                    |
|      |                                                                                                                |
|      | B. Final                                                                                                       |
|      |                                                                                                                |
|      | N/A                                                                                                            |
|      |                                                                                                                |
|      |                                                                                                                |
|      | Resp. Org. MR Below 1/9/84 Task Force Concurrence //                                                           |
| J    |                                                                                                                |

|     | A.               | Preliminary                                                                                                                                           |           |
|-----|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| )   |                  | N/A                                                                                                                                                   |           |
|     |                  |                                                                                                                                                       |           |
|     | В.               | Final                                                                                                                                                 |           |
|     |                  | N/A                                                                                                                                                   | •         |
|     |                  | •                                                                                                                                                     |           |
|     | Res              | sp. Org. MR Belew // 9/84 Task Force Concurrence                                                                                                      | / /       |
| 8B. | Imp              | Plementation and Inspection of Corrective Action for Completed Work                                                                                   |           |
|     | Α.               | Preliminary                                                                                                                                           |           |
|     |                  | N/A                                                                                                                                                   |           |
|     |                  |                                                                                                                                                       |           |
|     |                  |                                                                                                                                                       |           |
|     | R                | Final                                                                                                                                                 |           |
| )   | В.               | Final                                                                                                                                                 |           |
| )   | В.               | N/A                                                                                                                                                   |           |
| )   |                  | N/A                                                                                                                                                   |           |
| )   |                  |                                                                                                                                                       | ./ /      |
| 98- | Res              | N/A sp. Org. MR Below 1/9/84 Task Force Concurrence                                                                                                   | ./ /      |
| 9B. | Res              | N/A  Sp. Org. MR Below 1/9/84 Task Force Concurrence  entification and Evaluation of Ongoing Corrective Action for Future Wo                          | / /<br>rk |
| 98. | Res              | N/A  sp. Org. MR Below 1/9/84 Task Force Concurrence entification and Evaluation of Ongoing Corrective Action for Future Wo Preliminary               | / /<br>rk |
| 9B. | Res              | N/A  Sp. Org. MR Below 1/9/84 Task Force Concurrence  entification and Evaluation of Ongoing Corrective Action for Future Wo                          | / /<br>rk |
| 98. | Res              | N/A  sp. Org. MR Below 1/9/84 Task Force Concurrence entification and Evaluation of Ongoing Corrective Action for Future Wo Preliminary               | / /<br>rk |
| 98. | Res<br>Ide       | N/A  sp. Org. MR Below 1/9/84 Task Force Concurrence entification and Evaluation of Ongoing Corrective Action for Future Wo Preliminary               | / /<br>rk |
| 98. | Res<br>Ide       | sp. Org. MR Below 1/9/84 Task Force Concurrenceentification and Evaluation of Ongoing Corrective Action for Future Wo Preliminary  N/A                | / /<br>rk |
| 98. | Res<br>Ide       | N/A  sp. Org. MR Below 1/9/84 Task Force Concurrence  entification and Evaluation of Ongoing Corrective Action for Future Wo  Preliminary  N/A  Final | / /<br>rk |
| 98. | Res<br>Ide<br>A. | N/A  sp. Org. MR Below 1/9/84 Task Force Concurrence  entification and Evaluation of Ongoing Corrective Action for Future Wo  Preliminary  N/A  Final | / /<br>rk |

| 10B. | Ide | ntification of Corrective Action for Future Work                |     |
|------|-----|-----------------------------------------------------------------|-----|
|      | Α.  | Preliminary                                                     |     |
|      |     | N/A                                                             |     |
|      |     |                                                                 |     |
|      |     |                                                                 |     |
|      | В.  | Final                                                           |     |
|      |     | N/A                                                             |     |
|      |     |                                                                 |     |
|      | Res | p. Org. M R Belew 1/9/84 Task Force Concurrence                 | / / |
| 11B. | Imp | lementation of Corrective Action for Future Work                |     |
|      | Α.  | Preliminary                                                     |     |
|      |     | N/A                                                             |     |
|      |     |                                                                 |     |
|      |     |                                                                 |     |
|      | В.  | Final                                                           |     |
|      |     | N/A                                                             |     |
|      |     |                                                                 |     |
|      | Res | p. Org. M R Belur 1/9/84 Task Force Concurrence                 | / / |
|      |     |                                                                 |     |
| 12B. | Ver | ification of Effectiveness of Corrective Action for Future Work |     |
|      | Α.  | Preliminary                                                     | -   |
|      |     | N/A                                                             |     |
|      |     |                                                                 |     |
|      |     |                                                                 |     |
|      | R   | Final                                                           |     |
|      | в.  | Final                                                           |     |
|      | В.  | Final<br>N/A                                                    |     |
|      | В.  |                                                                 |     |

TVA 64 (08-0-68)

UNITED STATES GOVERNMENT

# Memorandum

TENNESSEE VALLEY AUTHORITY '841126 201 OMS

Quality Management Staff Files

FROM

J. W. von Weisenstein, 384 SPB-K

84112900353

DATE

1107 2 6 1984

SUBJECT:

ASSESSMENT OF ADEQUACY OF CORRECTIVE ACTION FOR FUTURE WORK FOR BLACK AND VEATCH TASK FORCE CATEGORY 5

For this category, the TVA task force for review of Black and Veatch findings determined that the condition was applicable to Watts Bar units 1 and 2 and that corrective action was required for completed and future work. QMS performed a surveillance in accordance with the attached scoping document to assess the adequacy of corrective action implementation for completed and future work, as well as the effectiveness of corrective action for future work. The results of that surveillance, contained in the attached surveillance report, verified the adequacy of the work accomplished.

Based upon our assessment of category 5, we conclude that this category can be closed by signing and dating item 12A, "Verification of Effectiveness of Corrective Action for Future Work."

JwW: MBP

Attachments

E. G. Beasley, W12C61 C-K (Attachments)

L. E. Brock, 396 SPB-K

J. S. Colley, 374 SPB-K (Attachments) H. L. Jones, W10D224 C-K

Principally Prepared By: J. W. won Weisenstein (7706)

11/26/84 - EGB:MBP

cc (Attachments):

R. W. Cantrell. Walas C-K

MEDS, WSB63 C-K

02520

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan



QUALITY HANAGEMENT STAFF
SURVEILLANCE REPORT FOR THE ASSESSMENT
OF THE EFFECTIVENESS OF CORRECTIVE ACTIONS
IDENTIFIED IN THE TASK FORCE REPORT ON THE
BLACK AND VEATCH FINDINGS

Prepared By: | Caregory: | S | Approved By: | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Date: | 1/20/84 | Da

Concerns: NO / / Yes / / (if yes, identify below) Results:

#### I. Management Summery:

The design processes evaluated are outlined in the attached surveillance scoping document and were determined to be in full compliance with requirements.

#### II. Conclusions and Recommendations:

Based upon the results of this surveillance, the corrective action implemented for both the completed and future work has been accomplished as committed by the TVA task force evaluation sheets for category 5.

# III. Details:

- A. Performed the following surveillance activities to verify the corrective action implementation for completed work:
  - Verify that a review of EEB valves was documented that verifies that ANSI class rating is consistent with the latest design pressure/temperature.

Results: Interviewed Marvin Belew of EEB who provided a copy of a WBN valve evaluation (EEB 830629 902) in which are listed several disparities in pressure and temperature values. This was resolved by WBEP as disclosed in an interview with Jerry Dorris. He indicated that the problem was really one of a misunderstanding in that it was thought that if the design pressure and design temperature were stamped on the valve plate then the valve could not exceed these values. However, the valves were AMSI class rated at much higher pressures and temperatures than design requirements. Therefore, the valves would meet the code even if there were pressures or temperatures higher than design values stamped on valve plate. It was merely a documentation problem and not a hardware deficiency problem.

Page 1 of 3

02420

2 10 3

2. Verify the results of the review in section III.A.1 by sampling:

Results: Obtained a copy of a WBN valve evaluation (REB 830629 902) and copies of MCR WBNEEB8207 and ECN 3511. The MCR and ECN changed the procurement design specifications to agree with design pressure/temperature on drawing 47W803-2.

 Verify that a review of interfaces of low pressure normally idle systems with high pressure normally operating systems for adequate presentation of design and operating conditions was documented.

Results: Interviewed Harvin Belew of EEB who indicated that the interface of low and high pressure systems was reviewed internally and that review was documented in the finding responses that are incorporated in appendix B of the Black and Veatch independent review of Watts Bar auxiliary feedwater system.

4. Verify the results of the review in section III.A.3 by sampling.

Results: Reviewed the Black and Veatch finding responses for findings F308, F314, F328, F894, F895, F896, F897, F307, F335, and F336 and they appear to be adequate.

- B. Performed the following surveillance activities to verify corrective action implementation for future work:
  - 1. Verify that EP 4.02 has been revised.

Results: EP 4.02 R13 was issued June 7, 1983, to reflect extensive changes in control of ECN S1. EP 4.02 is now in revision 16 dated July 23, 1984.

 Verify that a memorandum was issued in conjunction with EP 4.02 R13 to control the ECW S1.

Results: There were three memorandums written in conjunction with EP 4.02 Rl3 that dealt with the changing of procedure for control of ECM S1 (QAB 830301 001, OQA 830527 002, and OQA 830712 500).

3. Verify that EP 5.06 has been issued.

Results: EP 5.06 Rl was issued May 27, 1980, to reflect control of preparation and review of specifications. EP 5.06 is now in revision 2 dated July 23, 1984.

Page 2 of 3

C. Performed the following surveillance activities to assess the effectiveness of corrective action for future work.

Assess the effectiveness of the revisions to EPs 4.02 and 5.06 on the control of valve specifications for future work.

Results: As a result of the revision to EP 4.02, the use of the ECN S1 is better controlled in that some system changes that were handled by an ECN S1 are now handled by a regular ECN and are squadchecked through affected organizations. There is now better control over the preparation and review of future specifications as a result of the revision to EP 5.06.

#### IV. Documents Reviewed:

10CFR50

EN DES-EP 4.02

EN DES-EP 5.06

NCR WBNEEB8207

ECM 3511

Memorandums: P. L. Duncan's memorandum to R. M. Painter dated March 1, 1983, "EN DES-EP 4.02, Engineering Change Notice (ECM -Handling - TVA ECN S1 Update" (QAB 830301 001)

> J. W. Anderson's memorandum to H. N. Sprouse dated May 27, 1983, "Stopwork Action - Processing Design Changes by ECN S1" (OQA 830527 002)

> R. A. Costner's memorandum to H. N. Sprouse dated July 12, 1983, "EN DES-EP 4.02, Engineering Change Notices (ECNs) -Handling" (OQA 830712 500)

# V. List of Personnel Contacted:

| Name            | Title               | Organization |
|-----------------|---------------------|--------------|
| Marvin R. Belew | Section Supervisor  | abed         |
| T. G. Robinson  | Electrical Engineer | Red          |
| Jerry Dorris    | Section Supervisor  | Red          |

VI. Scoping Document (Attached)

Page 3 of 3

02420

# QUALITY HANAGENEMT STAFF SCOPING DOCUMENT FOR THE ASSESSMENT OF THE REPECTIVENESS OF CORRECTIVE ACTIONS IDENTIFIED IN THE TASK FORCE REPORT ON THE BLACK AND VEATCH FINDINGS

PLANT: Watts Bar Muclear Units 1 and 2

CATEGORY: \_\_\_\_\_\_\_

| Prepared By: 2 Brook Date: 49/18/84 | Approved By: |
|-------------------------------------|--------------|
|-------------------------------------|--------------|

I. Verification of Corrective Action Implementation for Completed Work

Perform the following surveillance activity:

- A.1. Verify that the following was documented: A review of EEB valves to verify ANSI class rating is consistent with latest design pressure/temperature.
- A.2 Verify the results of the review by sampling.
- B.1 Verify that the following was documented: A review of interfaces of low pressure, normally idle systems with high pressure, normally operating systems for adequate presentation of design and operating conditions.
- B.2. Verify the results of this review by sampling.
- II. Verification of Corrective Action Implementation for Future Work

Perform the following surveillance activity:

Verify that EP 4.02 has been revised, that a memorandum has been issued to control the ECN S1, and that EP 5.06 has been issued.

III. Assessment of Effectiveness of Corrective Action for Future Work

Perform the following surveillance activity:

Assess the effectiveness of the actions in II in controlling the work by sampling work output and comparing to the requirements.

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#### 1.0 GENERAL

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This design standard contains instructions for preparing detailed procurement specifications for certain items requisitioned by the Instrumentation and Controls (I&C) Contract Engineering Sections of the Electrical Engineering Branch (EEB).

Appendix A contains general instructions for data sheet preparation and the abbreviations that are to be used.

Appendix B contains detailed instructions for completing each line of a data sheet (TVA 10581). A copy of the data sheet relating to each different procurement item follows the instructions.

#### 2.0 RESPONSIBILITY

Areas of EN DES responsibility for initiating, reviewing, and routing of purchase requisitions and procurement documents are defined in EN DES-EP's 5.01, 5.20, and 5.33. (See section 5.0 for titles.)

#### 3.0 FORMAT

Whenever possible, the format defined in EN DES-EP 5.30 is to be used for the I&C technical specifications section of a purchase requisition.

Following is a list of the common parts of the specification. They should be ordered as shown.

CERTIFICATION SHEET--If applicable, in compliance with EN DES-EP 3.05.

ASME SECTION III LOCATOR SHEET--If applicable, as required by NCA-3252.

TITLE SHEET--Conforms to EN DES-EP 5.30, Attachment No. 1.

TABLE OF CONTENTS--Conforms to EN DES-EP 5.30, Attachment No. 1.

LIST OF ABBREVIATIONS AND ACRONYMS--If needed.

MAIN BODY--Patterned after EN DES-EP 5.30 whenever possible. The nine sections called for in section 5.5 of that EP are to be used in all formal (numbered) specifications. EN DES-EP 5.30 requirements on the nine standard sections are extended as follows:

- a. Include in 4.0 General Requirements the TVA classification for the equipment.
- 1. This design standard supersedes EN DES-EP 5.06.

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b. Information in 7.0 Detailed Requirements can be either written descriptions, completed uata sheets, or bills of material for standard instruments. If the specifications are written descriptions, the equipment must be thoroughly described by its operating and physical characteristics as well as its application description. If the specifications are on data sheets, the sheets must be completed in accordance with Appendix A of this design standard.

DATA SHEETS--See Appendix A of this design standard.

FIGURES/DRAWINGS -- As Required.

APPENDIXES--When used, include Contract Document Requirements List (CDRL), Vendors List of Submittals to the Materials Engineer (VLS-M), Vendors List of Submittals to the Technical Engineer (VLS-T) and any other pertinent information (see EN DES-EP 5.30, Attachment No. 1, page 21).

#### 4.0 REVIEW

Formal review of the specification occurs after it becomes a part of a requisition, prepared by the 1&C Contract Engineering Section, as described in EN DES-EP 5.01.

#### 5.0 REFERENCES

- 5.1 EN DES-EP 1.26, Nonconformances Reporting and Handling by EN DES
- 5.2 EN DES-EP 1.28, Control of Documents Affecting Quality
- 5.3 EN DES-EP 3.05, Design Specifications for ASME Boiler and Pressure Vessel Code Section III Components and Appurtenances - Preparation, Correlation and Certification
- 5.4 EN DES-EP 3.10, Design Verification Methods and Performance of Design Verifications
- 5.5 EN DES-EP 5.01, Purchase Requisitions Evaluation of Bids and Recommendation/Rejection of Contract Award Revisions to Contracts
- 5.6 EN DES-EP 5.20, Processing Procurement Requests
- 5.7 EN DES-EP 5.26, Quality Requirements for Design Documents Furnished by Vendors
- 5.8 EN DES-EP 5.30, Standard Format for the Preparation of Procurement Specifications

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- 5.9 EN DES-EP 5.33, Procurement Quality Assurance
- 5.10 QEB-EP 24.55, Shop Surveillance for Instrumentation and Control Components for TVA Procured Items
- 5.11 QRE-EP 24.58, Handling of Supplier Records
- 5.12 ANSI B40.1-1980, Gauges Pressure Indicating Dial Type Elastic Element
- 5.13 ANSI ICS6-1978, Enclosures for Industrial Controls and Systems
- 5.14 ANSI MC96.1-1975, Temperature Measurement Thermocouples

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#### APPENDIX A

# A1.0 DATA SHEET PREPARATION

The preferred form used to describe a piece of equipment is a data sheet designed to expedite the preparation of the specification. The design engineer shall be responsible for the adequacy of any data sheet he is required to complete. The existing data sheet will be used unless the designer can justify a data sheet revision. (Any changes to data sheets are to be coordinated with the I&C Contract Engineering Section of EEB.)

An independent reviewer must verify the data sheets for the procurement request as directed by EN DES-EP 5.20.

#### 1.1 SEPARATE LISTINGS

Data sheets generally describe several instruments of the same type. In certain cases, similar instruments should be listed on separate data sheets. These guidelines should be observed when listing similar instruments on data sheets.

- Similar instruments in different systems shall be listed on separate data sheets.
- b. Similar instruments with different qualification requirements shall be listed on separate data sheets (e.g., non-safety related, seismin category I(L) and IEEE Class IE devices shall not be listed on the same data sheets).
- c. Instruments that are similar in function or design shall be listed on separate data sheets if their operational characteristics differ greatly from each other, that is, if there are great variations in spans, operating pressures or temperatures, etc.

#### 1.2 REPRODUCTION

Data sheets will be reproduced many times, so only black ink (ballpoint or fine felt tip) shall be used - filling in the data sheet blanks. Do not use pencil or in than than black to fill out data sheets. Whenever possible reproductions of data sheets shall be made from originals.

All information shall be inside the heavy black borderline on the data sheet page to avoid losing information during the reproduction process.

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# 1.3 SPECIFYING ENVIRONMENTAL CONDITIONS FOR CLASS 1E EQUIPMENT

When a device is specified as IEEE Class 1E equipment, data sheet TVA-10581-30 shall be completed by the design project and included in the Purchase Request (PR). If this data sheet is not included in the PR, the procuring branch will return the PR to the originating branch/project. (Processing procedures are described in EP 5.20).

#### 1.4 USE OF "MANUFACTURER'S STANDARD"

"Manufacturer's Standard" ("MS") shall be used to specify an operating characteristic only when the performance of that characteristic will not affect the intended function of the device or its ability to interface with other equipment.

"MS" shall not be used to specify operating or interfacing characteristics that affect the ability of the device to perform its intended function when those characteristics have not been defined by the design engineer.

## 1.5 DEVICE IDENTIFICATION

The information entered on TVA form 10581-XX (data sheets) shall reflect the actual minimum requirements for the process function. It shall not reflect the performance characteristics of any particular manufacturer's equipment except where the item must match and work with existing equipment and where the interface requirements of the existing equipment cannot be determined. The "Manufacturer" and "Model No." planks on the TVA data forms are intended for identifying only the general type of device required. They do not define the performance characteristics of the device.

### 1.6 INSTRUMENTS IN A LOOP

In this design standard, an instrumentation loop means a group of instruments (transmitters, power supplies, indicators, controllers, etc.) connected to form a system that performs a specific function. When specifying single instruments that form part of a loop, the designer must ensure that all instruments perform satisfactorily with other instruments in the loop. When specifying an instrument that is part of a loop, TVA form 10581-31 (see section 2.31) must be completed and included in the PR. If the form is not included the PR will be returned to the design project engineer by the Procurement Group.

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# 1.7 DATA SHEETS (FORM TVA-10581-XX)

Individual data sheet forms are available for each type of instrument. Samples of the data forms and instructions for completion are in Appendix B. These are:

| TVA-10581- | <u>Title</u>                                             |
|------------|----------------------------------------------------------|
| 01         | General                                                  |
| 02         | Steam Orifice Plate                                      |
| 03         | Liquid Orifice Plate                                     |
| 04         | Gas Orifice Plate                                        |
| 05         | Thermocouples and Test Wells                             |
| 06         | Level Switcher                                           |
| 07         | Pressure Switches                                        |
| 08         | Pressure Gauges                                          |
| 09         | Recorders                                                |
| 10         | Alarm Switches                                           |
| 11         | Differential Pressure Gauges                             |
| 12         | Differential Pressure Switches                           |
| 13         | Temperature Switches                                     |
| 14         | Control Valves                                           |
| 15         | EMF to Current Converter                                 |
| 16         | Differential Pressure Transmitter (Electronic)           |
| 17         | Elec to Elec Controller                                  |
| 18         | Pnuematic Controller                                     |
| 19         | Power Supply                                             |
| 20         | Electrical Indicators                                    |
| 21         | Bimetal Thermometers and Mating Wells                    |
| 22         | Liquid Level Gauges                                      |
| 23         | Pressure Transmitter (Electronic)                        |
| 24         | Soleno.d Valves                                          |
| 25         | Rotameters                                               |
| 26         | Displacer Type (Pnuematic) Level Controller              |
| 27         | Displacer Type (Electronic) Level Controller/Transmitter |
| 28         | Square Root Converter                                    |
| 29         | Limit Switches                                           |
| 30         | Environmental Conditions for Class IE Eqpt               |
| 31         | Loop Data                                                |

# A2.0 ABBREVIATIONS

The abbreviations used in this design standard are from one of the following sources or have been created specifically for use on the data sheets:

a. Abbreviations and Symbols, TVA, 1980

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b. American National Standards Institute (AMSI) Standard Y1.1-1972

A - Ampere (when used with a prefix, i.e., mA)

AC - Alternating current

ADJ - Adjustable

ALM - Alarm AMB - Ambient

AMP - Ampere AMPL - Amplifier

ANSI - American National Standards Institute

AUTO-MAN - Automatic to manual

AUX - Auxiliary BARO - Barometric

C - Degrees CelsiusCA - Calibrated accuracy

CA - Calibrated accu CALC - Calculated

CAL - Calibration
CAP - Capacity
CHKR - Checker
CKT - Circuit
CONN - Connection
CONT - Control

CV - Valve coefficient of flow

DC - Direct current

DECR - Decrease
DSGNR - Designer
DIA - Diameter
DIAPH - Diaphragm
DIFF - Differential
DIM - Dimension

ECN - Engineering Change Notice

EFF - Effect ELEC - Electrical

DISPL

EMF - Electromotive force

- Displacer

ENGR - Engineer (usually the designer)

EXT - External EXTN - Extension

F - Degrees Fahrenheit
FT/S - Feet per second
FS - Full scale
GPM - Gallons per minute

GND - Ground

Hz - Hertz (cycles per second)

ID - Inside diameter
ILLUM - Illumination
IMPD - Impedance
INC - Incremental

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INCR - Increase
INDEP - Independent
INDIC - Indicating
INS - Insulation

ISOL - Isolation (electrical)

JCT - Junction

LBf - Pound (force)

LBm - Pound (mass)

LG - Length

LIM SW - Limit Switch

LT - 'ight
MAN - manual
MATL - Material
MAX - Maximum
MEAS - Measurement
MFR - Manufacturer
MIN - Minimum

MS - Manufacturer's Standard

MULT - Multiple NA - Not applicable

NEMA - National Electrical Manufacturers Association

NO. - Number
NOM - Nominal
NPT-F - Nationa

NPT-F - National pipe thread-female

OPRG - Operating

OVV PROT - Overvoltage protection

PD - Pipe diameters

PNL - Panel POSN - Position

PR - Procurement Request

PRESS - Pressure
PROPNL - Proportional
PROT - Protection

PSIA - Pounds per square inch absolute PSIG - Pounds per square inch gauge

PT - Point
QTY - Quantity
R - Revision
REF - Reference
REQD - Required

RFF - Raised face flange

RGLTR - Regulator RMT - Remote RNG - Range

RTJ - Ring type joint

SCFM - Standard cubic feet per minute

SCHED - Schedule

SG - Specific gravity

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SIG- Signal

SOV - Solenoid valve

SPGR - Specific gravity

SPLY - Supply

SST - Stainless steel

- Superheat SUPRHT

- Switch SW

- System SYS - Thermocouple

TC TEMP - Temperature

- Termination TERM

- Thread THD

- Temperature and pre ure T-P

UNGND - Ungrounded

UNID - Unique identification

VIS - Visible

- Valve V

- Water column WC

WG

Water gaugeWetted surface WS

- Transfer XFR

- Differential pressure  $\Delta P$ 

- Percent

- Pounds

- Pounds per hour #/hr

- Single phase 1 9

- Or clual

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# B1.0 GENERAL (TVA-10581-01)1

The first ten lines of the data sheets are for general information common to all data sheets. The first data sheet in the series is for use when no standard data sheet is available or as a supplementary or continuation sheet for a standard sheet.

The following instructions on the first ten lines apply to all of the data sheets:

- Line 1 ITEM NO.--This is the requisition item number and should be left blank. It will be filled in by procurement personnel when the requisition is assembled.
- Line 2 QUANTITY--Enter the total number of devices being specified on this data sheet, or enter "See Below" if they are tabulated below.
- Line 3 INSTRUMENT NO.--Enter the instrument number(s) if there are only a few. If there are too many to fit on this line, write "See List" or "See Below," whichever applies.

The instrument number is the unique identification (UNID) number. On those data sheets where there is only one device listed, the UNID number is placed here. On those data sheets where a number of devices are listed in columns, the UNID number is shown in the column.

- Line 4 IEEE CLASS--For equipment that must be qualified in accordance with IEEE-323, place an "X" in the block labeleu "IE", otherwise place an 'X" in the block marked "NA" (see Note 4).
- Line 5 SEISMIC CATEGORY--For equipment requiring seismic qualification, place an "X" in the block labeled "I" or "I(L)." For equipment not requiring seismic qualification, mark "NA."
- Line 6 ASME CODE CLASS--For equipment requiring certification to the ASME code enter the applicable code class; otherwise place an "X" in the block labeled "NA."
- Line 7 MANUFACTURER--This line is used when only one manufacturer's product is known to be acceptable, or to identify a preferred manufacturer whose equipment is described on the data sheet.

  Use "or equal" symbol when filled in.

If the instrument forms part of an instrument loop, Form TVA-10581-31 must also be completed (see B31.0).

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line 8 - MODEL NO.--This is filled in when line 6 is used. Use "or equal" symbol when filled in.

Line 9 - CASE STYLE/MATL--Use for case style and material.

Line 10 - ENCLOSURE--Use such descriptions as general purpose, dustproof watertight, or NEMA 1, 3, 4, 12 in accordance with ANSI/NEMA ICS 6-78.

Line 11 - MOUNTING--Such as surface, flush panel, or pipe stand.

The rest of the sheet should also be completed as follows:

REQUISITION NO. --Leave this space blank. It will be filled in, when necessary, by the procurement section.

SPECIFICATION NO. -- Leave blank.

DATA SHEET NO.:--This should be identified by a number as assigned by your design project; otherwise it will be filled in by the procurement section.

PLANT -- Identity the project.

PR--Enter the procurement request number.

ECN--Enter the ECN number when applicable.

 ${\tt DSGNR\textsuperscript{--}Identify}$  yourself and the date.

CHKR--Have the checker initial and date.

#### Notes:

- Each data sheet has some space to use for remarks and information in footnotes. Place a number in parentheses on the line to which the mote refers and a corresponding number in parentheses next to the note at the bottom of the data sheet. Use this area for special comments, unusual features, and accessory specifications.
- Try to make each data sheet as complete as possible. Refer to information in the general specifications or procurement request only as a last resort.
- Data sheet sections marked "Bidder information" are to be completed by the bidder only; do not write in these spaces.

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 If devices are specified as IEEE Class IE, complete environmental conditions must be provided on Data Sheet TVA-10581-30 and attached to the data sheet for the device. (See Section B30.0 of this appendix.)

| TV       | A 10     | 581-     | -01 (EN DES-2-84)                                | REQUIS       | SITION NO.            |
|----------|----------|----------|--------------------------------------------------|--------------|-----------------------|
|          |          |          | MAIN DA                                          |              |                       |
|          |          | 2        | QUANTITY                                         |              |                       |
|          |          |          | TRISTITUDENT NO.                                 |              |                       |
|          | GENERAL  | 4        | HEEE CLASS                                       |              | 7.384                 |
|          |          | 5        | SELSHIC CATEGORY                                 |              | O MA                  |
| lack     | 9        | 6        |                                                  |              | 1.00                  |
| $\vdash$ | -        | 1        | MANUPACIURER                                     | <del> </del> |                       |
|          |          | 8        | MODEL NO.<br>CASE STYLE/MATL                     |              |                       |
| Н        |          | 18       |                                                  |              |                       |
| $\vdash$ | <u> </u> | 155      | MOUNTING                                         |              |                       |
|          |          | 112      |                                                  |              |                       |
|          |          | 113      |                                                  |              |                       |
|          |          | 114      |                                                  |              |                       |
|          |          | 115      |                                                  |              |                       |
| L        |          | 16       |                                                  |              |                       |
|          |          | 117      |                                                  |              |                       |
| <u> </u> |          | 118      |                                                  |              |                       |
| <b></b>  |          | 119      |                                                  |              |                       |
| -        |          | 20<br>21 | <del></del>                                      |              |                       |
| -        |          | 22       | <del>                                     </del> |              |                       |
| -        |          | 23       |                                                  |              |                       |
| <b>-</b> |          | 24       | 1                                                |              |                       |
|          |          | 25       |                                                  |              |                       |
|          |          | 26       |                                                  |              |                       |
|          |          | 27       |                                                  |              |                       |
|          |          | 128      |                                                  |              |                       |
| L_       |          | 29       |                                                  |              |                       |
| <u> </u> |          | 130      | 4                                                |              |                       |
| -        |          | 31       |                                                  |              |                       |
| -        |          | 32<br>33 |                                                  |              |                       |
| -        |          | 34       |                                                  |              |                       |
| -        |          | 35       |                                                  |              |                       |
| -        |          | 36       |                                                  |              | -                     |
|          |          | 37       |                                                  |              |                       |
|          |          | 38       |                                                  |              |                       |
|          |          | 39       |                                                  |              |                       |
|          |          | 40       | )                                                |              |                       |
|          |          | 41       |                                                  |              |                       |
| $\vdash$ |          | 42       |                                                  |              |                       |
| -        |          | 43       |                                                  |              |                       |
| <b> </b> |          | 45       | <del>}</del>                                     |              |                       |
| $\vdash$ |          | 46       |                                                  |              |                       |
|          |          | 47       |                                                  |              |                       |
|          |          |          |                                                  |              | <u> </u>              |
| χ.       | D/       | ATA      | BY BIDDER                                        | NOTES: (1)   |                       |
|          | 01       | R EC     | JUAL                                             | 1            |                       |
| l N/     | AN(      | OT A     | APPLICABLE                                       | 1            |                       |
| M:       | SMI      | FR S     | STANDARD                                         |              |                       |
| 1 ~      | CCHC     |          | DATE -                                           | 1            |                       |
|          | SGNR     |          | DATE:                                            | 1            | SPECIFICATION NO.     |
| I C      | HKR:     |          | DATE:                                            |              | S. EVALANCIA AND INC. |
| - 0      | LANT     |          |                                                  | PR NO.       |                       |
| 1        | LVII I   | •        |                                                  | ECN NO.      | DATA SHEET NO.        |

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# B2.0 STEAM ORIFICE PLATE (TVA-10581-02)1

Lines 1-3 and 5-8 should be filled out in accordance with the instructions in section B1.0.

Line 11 - MOUNTING--Give the rating and description such as 300# RFF (raised face flange) or 600# RTJ (ring type joint).

Line 12 - STEAM QUALITY--In percent or saturated.

Line 13 - STEAM SUPRHT--Give superheat in degrees F or C (zero if saturated).

Line 14 - BARO PRESS--Give average barometric pressure or altitude above sea level.

Line 15 - ACCURACY--Give required accuracy in engineering units over the range of interest. (For example: ±10#/hr from 100,000 to 300,000 #/hr.)

Line 16 - METER TYPE--Bellows, diaphragm, mercury, etc.

Line i8 - MATERIAL PLATE -- 304SST, 316SST, etc.

Line 19 - DRAIN HOLE--Yes or no. Usually yes, particularly if the steam is saturated.

Line 20 - TAP LOCATION--Designate "flange" (1" upstream and 1" downstream), "vena contracta" (1 PD upstream and vena contracta downstream), or "pipe taps" (2-1/2 PD upstream and 8 PD downstream).

Columns - The columns have been designed for listing more than one orifice plate per page.

ITEM NO.--Will be filled in by procurement personnel.

INSTRUMENT NO. -- Identify each plate.

QTY--Number of plates with this instrument number.

PIPE SIZE--Nominal pipe size.

<sup>1.</sup> Completion of TVA 10581-31 also required (see B31.0).

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SCHED OR ID--Enter the pipe schedule number or give the exact internal diameter.

OPRG TEMP F--Give the operating temperature (degrees F). If temperature varies, give range.

OPRG PRESS PSI--Give the operating pressure (psig or psia, state which). If pressure varies, give range.

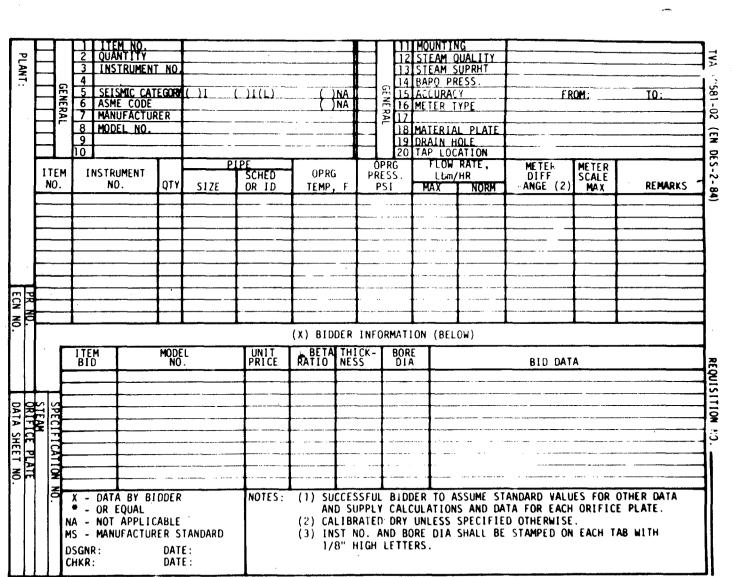
FLOW RATE LBM/HR--Under "MAX" enter the maximum flow rate or if used with a transmitter, indicator, or recoider, give the 100-percent full-scale flow rate. Under "NORM" enter the normal flow rate, or if it varies widely, show 70 percent of maximum.

METER DIFF RANGE--Enter the differential that will result in a 100-percent tull-scale deflection (or output) on the meter for transmitter) used with the orifice. Where possible give the differential in inches water column ("WC"). (As indicated by Note (2), this is usually for a meter calibrated dry.)

METER SCALE MAX--Give the maximum (100 percent) scale reading of the meter (or for a transmitter, list the maximum flow rate to be measured).

#### NOTE

The "METER DIFF RANGE" must correspond with the "METER SCALE MAX" (i.e., the meter or transmitter must show 100-percent full-scale deflection (output) when the differential input is equal to the specified "METER DIFF RANGE").



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# B3.0 LIQUID ORIFICE PLATE (TVA-10581-03)1

Lines 1-3 and 5-8 should be filled out in accordance with the instructions in section B1.0.

- Line 11 MOUNTING--Give the rating and description such as 300# RFF (raised face flange) or 600# RTJ (ring type joint).
- Line 12 LIQUID--Give the name of the flowing medium such as raw water or condensate.
- Line 13 BASE TEMP--Give the temperature on which volumetric flows are based.
- Line 14 S G @ BASE TEMP--Give the specific gravity at the base temperature. Water is 1.0 at  $39.1^{\circ}F$ .
- Line 15 ACCURACY--Give required accuracy in engineering units over the range of interest. (For example: ±5 gpm from 400-500 gpm.)
- Line 16 METER TYPE--Bellows, diaphragm, mercury, etc.
- Line 18 MATERIAL PLATE--304SS, 316SS, etc.
- Line 19 VENT LOCATION--Designate "top" if the fluid may have entrained gases; otherwise write 'none."
- Line 20 TAP LOCATION--Designate "flange" (1" upstream and 1" down-stream) "vena contracta" (1 PD upstream and at the vena contracta downstream), or "pipe taps" (2-1/2 PD upstream and 8 PD downstream).
- Columns The columns can accommodate listing more than one orifice plate per page.

ITEM NO.--Will be filled in by procurement personnel.

INSTRUMENT NO. -- Identify each plate.

QTY--Number of plates with this instrument number.

. PIPE SIZE--Nominal pipe size.

<sup>1.</sup> Completion of TVA 10581-31 also required (see B31.0).

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SCHED OR ID--Enter the pipe schedule number or give the exact internal diameter of the pipe.

OPRG TEMP F--Give the operating temperature (degrees F). If operating temperature varies give range.

OPRG IMESS PSI--Give the operating pressure (psig or psia, state which).

FLOW RATE GPM--Under "MAX" list the maximum flow rate or if used with a transmitter, indicator, or recorder, give the 100-percent full-scale flow rate. Under "NORM" list the normal flow rate, or if it varies widely, enter 70 percent of maximum.

METER DIFF RANGE--Enter the maximum differential for 100-percent full-scale flow. This is usually expressed as inches of water column ("WC"). As indicated by Note (2), this is usually for a meter calibrated dry.

METER DIFF RANGE--Enter the differential the will result in a 100-percent full-scale deflection (or output) on the meter (or transmitter) used with the orifice. Where possible give the differential in inches water column ("WC"). As indicated by Note (2) this is usually for a meter calibrated dry.

METER SCALE MAX--Enter the maximum (100-percent) scale reading of the meter (or for a transmitter, enter the maximum flow rate which is to be measured).

### NOTE

The "METER DIFF RANGE" must correspond with the "METER SCALE MAX" (i.e., the meter or transmitter must show 100-percent full-scale deflection (output) when the differential input is equal to the specified "METER DIFF RANGE").

1 ITEM NO. 2 QUANTITY TTIMOUNTING 12 L IQUID 3 INSTRUMENT NO 13 BASE TEMP 10581-03 14 SG @ BASE TEMP GENERAL ( )NA ( )NA 5 SEISMIC CATEGORY 15 ACCURACY FROM: 6 ASME CODE CLASS 7 MANUFACTURER 8 MODEL NO. 16 METER TYPE 17 18 MATERIAL PLATE 19 VENT LOCATION DES. 10 20 TAPE LOCATION METER SCALE OPRG FLOW RATE. **METER** INSTRUMENT ITEM **OPRG** -2-84) SCHED OR ID DIFF (2) PRESS. **GPM** REMARKS NO. NO. TEMP, F SIZE PSI MAX NORM RANGE MAX BIDDER INFORMATION (BELOW) E BETA THICK-UNIT BORE ITEM MODEL BID DATA REQUISITION PRICE RATIO NESS DIA BID NO. 3 NOTES: (1) SUCCESSFUL BIDDER TO ASSUME REASONABLE VALUES FOR OTHER DATA X---DATA BY BIDDER \*---OR EQUAL NA--NOT APPLICABLE AND SUPPLY CALCULATIONS AND DATA FOR EACH ORIFICE PLATE. (2) CALIBRATED DRY UNLESS SPECIFIED OTHERWISE. MS--MANUFACTURER STANDARD (3) INST NO. AND BORE DIA SHALL BE STAMPED ON EACH TAB WITH 1/8" HIGH LETTERS. DSGNR: DATE: DATE: CHKR:

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GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD D8-E18.3.5

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### B4.0 GAS ORIFICE PLATE (TVA-10581-04)1

Lines 1-3 and 5-8 should be filled out in accordance with the instructions in section B1.0.

- Line 10 ACCURACY--Give required accuracy in engineering units for the range of interest. (For example: ISCFM from 30-50 CFM)
- Line 11 MOUNTING--Give the rating and description such as 300# RFF (raised face flange) or 600# RTJ (ring type joint).
- Line 12 GAS--Give the name of the flowing medium such as natural gas, air, or nitrogen.
- Line 13 BASE TEMP--Give the temperature on which the volumetric measure at standard conditions is based.
- Line 14 S G @ BASE TEMP--Give the specific gravity of the gas (air = 1.0) or the molecular weight if known.
- Line BASE PRESS--Give the absolute pressure on which the volumetric measure at standard conditions is based.
- Line 16 EARO PRESS--Give the average barometric pressure or the altitude above sea level.
- Line 17 METER TYPE--Bellows, diaphragm, mercury, etc.
- Line 18 CR (F p) BASE--Give the supercompressibility factor if known by Otherwise it will be calculated by the orifice supplier.
- Line 19 MATERIAL PLATE--304SS, 316SS, etc.
- Line 20 DRAIN HOLE--Yes or no. Write "yes" if the gas or vapor is wet and there is a possibility of liquid condensing and collecting in front of the plate. Otherwise write "no."
- Line 21 TAP LOCATION--Designate "flange" (1" upstream and 1" down-stream), "vena contracta" (1 PD upstream and at the vena contracta downstream), or "pipe taps" (2-1/2 PD upstream and 8 PD downstream).

<sup>1.</sup> Completion of TVA 10581-31 also required (see B31.0).

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Columns - The columns can accommodate listing more than one orifice plate pur page

ITEM NO. -- Will be filled in by procurement personnel.

INSTRUMENT NO. -- Identify each plate.

QTY--Number of plates with this number.

PIPE SIZE--Nominal pipe size.

SCHED OR ID--C we the pipe schedule number or give the exact caternal diameter of the pipe.

OPRG TEMP F--Give the operating temperature (degrees F). If temperature varies give range.

oPRG PRESS PSIG--Give the operating pressure (psi gauge preferred). If pressure varies give range.

FLOW RATE, SCFM--Under "MAX", list the maximum flow rate or if used with a transmitter, indicator, or recorder, give the 100-percent full-scale flow rate. Under "NORM" give the normal flow rate, or if it varies widely, show 70 percent of maximum.

METER DIFF RANGE--Enter the differential that will result in a 100-percent full-scale deflection (or output) on the meter (or transmitter) used with the orifice. Where possible give the differential in inches water column ("WC"). As indicated by Note (2) this is usually for a meter calibrated dry.

METER SCALE MAX--Enter the maximum (100-percent) scale reading of the meter (or for a transmitter, give the maximum flow rate which is to be measured).

### NOTE

The "METER DIFF RANGE" must correspond with the "METER SCALE MAX" (i.e., the meter or transmitter must show 100-percent full-scale deflection (or output) when the differential input is equal to the specified "METER DIFF RANGE").

11 MOUNTING TITEM NO. QUANTITY 2 QUANTITY 3 INSTRUMENT NO. 12 GAS 13 BASE TEMP 14 SG @ BASE TEMP 15 BASE PRESS. 5 SEISMIC CATEGORY ( 6 ASME CLASS 7 MANUFACTURER 16 BAROPRESS 17 METERTYPE Ê 8 MODEL NO. 18 CR (FPY) BASE 19 MATERIAL PLATE 9 DES-2-84 10 ACCURACY 20 DRAIN HOLE FROM: TO: 21 TAP LOCATION PRESS. FLOW RATE, XCFM ITEM INSTRUMENT QTY SCHED OR ID METER DIFF CALE
RANGE(2) TEMP, F SIZE REMARKS NO. NO. MAX NORM (X) BIDDER INFORMATION (BELOW) REQUISITION BORE DIA ≅ 3ETA THICK-RATIO NESS TTEM MODEL UNIT BID DATA PRICE NO. BID SPECIFICATION
GAS
ORIFICE PLATE
DATA SHEET NO. (1) SUCCESSFUL BIDDER TO ASSUME STANDARD VALUES FOR OTHER DATA NOTES: X---DATA BY BIDDER AND SUPPLY CALCULATIONS AND DATA FOR EACH ORIFICE PLATE. \*---OR EQUAL NA--NOT APPLICABLE
MS--MANUFACTURER STANDARD
CR--COMPRESSIBILITY RATIO (2) CALIBRATED DRY UNLESS SPECIFIED OTHERWISE. (3) INST NO. AND BORE DIA SHALL BE STAMPED ON EACH TAB WITH 1/8" HIGH LETTERS. DATE: DSGNR: DATE: CHKR:

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GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

OFIG ISSUE: 5-15-84

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# B5.0 THERMOCOUPLES AND TEST WELLS (TVA-10581-05)

Before specifying thermocouple assemblies or test wells, the designer should become familiar with ANSI-MC 96.1-1975, "Temperature Heasurement Thermocouples," published by the Instrument Society of America (ISA).

The first eleven lines should be filled out in accordance with the instructions in section B1.0, except line 10, HEAD MATERIAL, where the head material should be listed, such as cast iron or aluminum. On line 10 indicate where the assembly is mounted, such as pipe, elbow, duct.

Line 12 - ISA TYPE--List the thermoc uple materials and ISA type such as:

Copper-Constantan Type T Iron-Constantan Type J Chromel-Alumel Type K Chromel-Constantan Type E

- Line 13 GAUGE--Enter the wire size of the element.
- Line 14 SHEATHED--Check "yes" or "no." If "yes" is checked, indicate sheathing material required.
- Line 15 INSULATION--List the material of the insulation. If it is sheathed it will be MgO or the like. If it is not sheathed, list material and type such as:

Ceramic - Circular - One piece Ceramic - Oval - 1" Lengths Ceramic - Fish Spine

- Line 16 NIPPLE SIZE--Give the nipple size and length. 3/4" IPS is typical. If a union is required, check "yes", otherwise check "no."
- Line 17 CONDUIT--Give the connection size for the coduit.
- Line 18 WELL ( ) TUBE ( )--Check whether the thermocouple is to be supplied with a well or tube and indicate material.
- Line 19 TYPE--Specify whether the well is "straight" or "tapered."
  A protection tube is "straight"
- Line 20 CONSTRUCTION--Specify whether a dcilled or a built-up well is required.

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Line 21 - CONN SIZE--Specify the process or external connection size.

Columns - The columns can accommodate listing more than one thermocouple assembly or test well per page.

ITEM NO.--This is the contract item number and will be filled in by procurement personnel.

INSTRUMENT NO.--Give the unique identification (UNID) number. There may be two instrument numbers per thermocouple/well combination (e.g., TW and TE, which fit together).

QTY--Enter the quantity of assemblies with this number.

DIMENSION U. --Enter the insertion length (in inches).

T.--Enter the lagging extension length (in inches).

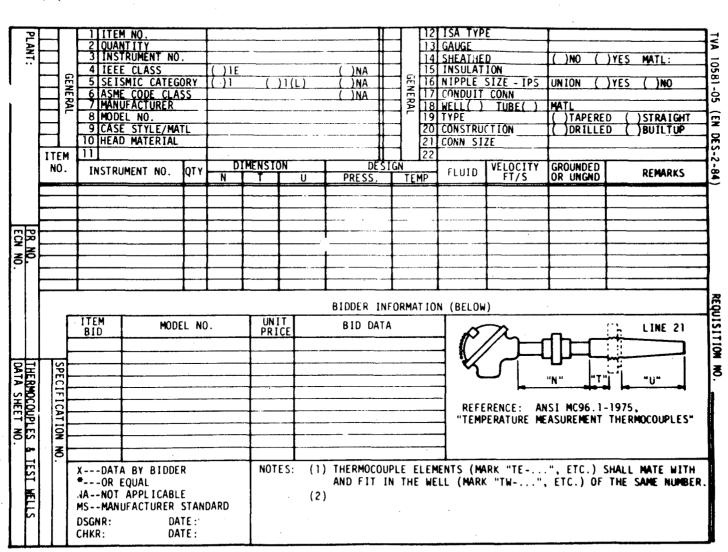
N.--Enter the connection head extension length (in inches).

DESIGN - PRESSURE and TEMP--Give the design pressure and temperature for the pipe or system in which the assembly will be installed.

FLUID--Give the tlowing fluid.

VELOCITY FT/S--Enter the maximum velocity of the fluid. When specifying fluid velocity, be sure to allow for vibrational effects (see "Power Test Code Thermometer Wells" by J. W. Murdock published in Transactions of ASME, Journal of Engineering for Power, October 1959).

GROUNDED or UNGND--Specify whether the thermocouple tip will be grounded or ungrounded in the well or sheath.



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#### B6.0 LEVEL SWITCHES TVA-10581-06)

The first eleven lines should be filled out in accordance with the instructions in section B1.0.

- Line 12 TYPE--Enter the type of the required level measurement technique (float, conductivity, sonic, displacer, etc.).
- Line 13 CONDUIT CONN--Enter the conduit connection size.
- Line 14 ELEC TERM--Give the type of electrical termination desired such as screw terminals or 18" leads.
- Line 15 SWITCH TYPE--Give the type of switch (dry contact, semiconductor, snap, etc.) desired. (Mercury is not allowed in nuclear plants.)
- Line 18 PROOF PRESS--Give the maximum pressure the unit must withstand without a change in calibration.
- Line 20 PROCESS CONN--Enter the size and type of the process connection.
- Columns The columns can accommodate listing more than one level switch per page.

ITEM NO. This is the contract item number and will be filled in by procurement personnel.

INSTRUMENT NO. Enter the unique identification (UNID) number.

QTY--Enter the quantity of units with this number.

SERVICE - ADJ RANGE--Enter the range over which the set point can be adjusted. Be sure to specify the units of measurement. If you cannot list these units at the top of the column, put a number in the parentheses and add the information under a numbered note.

SERVICE - FLUID--Enter the kind the material that is being monitored.

SERVICE - TEMP MAX--Enter maximum design temperature.

SERVICE - PRESS MAX--Enter maximum design pressure.

SERVICE - WS PARTS MATL--List the materials of construction for the wetted surface parts.

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SWITCH - QTY and FORM--Give the number of switches in each instrument and the configuration of the poles, such as 1 - DPDT or 2 - SPST.

SWITCH - CONTACT RATING - AMP, VOLT, and AC or DC--List the required contact rating for the service such as 0.1, 140, DC or 5, 120. AC. This may require both minimum and maximum contact ratings in order to satisfy both electrical and mechanical requirements.

TRIP POINT - LEVEL, INCR DECR, OPEN CLOSE--Give the range in engineering units of the required trip point. Note: This must be the required trip range including required repeatability, not the adjustable range of the switch.

RESET POINT FIXED LEVEL, ADJUSTABLE RANGE/REPEATABILITY--If the required reset range is known at time of specification, specify the range in engineering units of the required reset point. The reset range must include the remited repeatability. If reset point must be field adjustable, specify the range of adjustment and the required repeatability of the reset point in engineering units.

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| PLANT:        | 1 ITEM NO. 2 QUANTITY 3 INSTRUMENT NO. 4 IEEE CLASS 5 SEISMIC CATEGORY 6 ASME CODE CLASS 7 MY.NUFACTURER 8 MODEL NO. 9 CASE STYLE/MATL TO ENCLOSURE |                |                   |                               |       |                     | ( )1E ( )NA<br>( )1 ( )1(L ) ( )NA<br>( )NA<br>SERVICE |      |                                                         |                        |          |     | 12<br>13<br>14<br>15<br>16<br>17<br>18 | 12 TYPE 13 CONDUIT CONN 14 ELEC TERM 15 SWITCH TYPE 16 17 18 PROOF PRESS. 19 20 PROCESS CONN |    |                     |                                 |      |       |                           |  |  |  |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------|-------------------------------|-------|---------------------|--------------------------------------------------------|------|---------------------------------------------------------|------------------------|----------|-----|----------------------------------------|----------------------------------------------------------------------------------------------|----|---------------------|---------------------------------|------|-------|---------------------------|--|--|--|
|               | ITE!                                                                                                                                                |                | INSTRUMENT<br>NO. |                               | QTY   | ADJ<br>RANGE<br>( ) | FLUID<br>()                                            | TEMO | PRESS.<br>MAX<br>( )                                    | WS(1)<br>PARTS<br>MATL | QTY      | FOR | 1 R                                    | NTACT<br>AT ING<br>VOLT                                                                      | OR | TRIP<br>LEVEL<br>() | SMITCH<br>POINT<br>INCR<br>DECR | OPEN | FTXED | ESET P<br>ADJUST<br>RANGE |  |  |  |
| PR NO.        |                                                                                                                                                     |                |                   | c                             |       |                     |                                                        |      |                                                         |                        |          |     |                                        |                                                                                              |    |                     |                                 |      |       |                           |  |  |  |
| LEVE          | SPX                                                                                                                                                 | ITEM MODEL NO. |                   |                               |       |                     |                                                        |      | BIDDER INFORMATION (BELOW)  UNIT UNIT PRICE WT BID DATA |                        |          |     |                                        |                                                                                              |    |                     |                                 |      |       |                           |  |  |  |
| EVEL SHITCHES | SPECIFICATION NO                                                                                                                                    |                |                   |                               |       |                     |                                                        |      |                                                         |                        |          |     |                                        |                                                                                              |    |                     |                                 |      |       |                           |  |  |  |
|               |                                                                                                                                                     | N. M.          | (<br>A1           | OR EQ<br>IOT A<br>IANUF<br>I: | PPL I | ABLE                | TANDAR<br>E:                                           |      | NOTES                                                   | <u>1</u><br>: (1)      | WS = WET | TE  | ) SUI                                  | RFACE                                                                                        |    |                     |                                 |      |       |                           |  |  |  |

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### B7.0 PRESSURE SWITCHES (TVA-10581-07)

The first eleven lines should be filled out in accordance with the instructions in section B1.0.

- Line 13 CONDUIT CONN--Enter the conduit connection size.
- Line 14 ELEC TERM--Enter the type of electrical termination desired, such as screw terminals or 18" leads.
- Line 15 SWITCH TYPE--Enter the type of switch desired, such as snap or mercury. (Mercury is not allowed in nuclear plants.)
- Line 18 PROOF PRESS--Enter the maximum pressure the unit must withstand without a change in calibration.
- Line 19 WS PARTS MATL--Enter the materials of construction for parts in contact with process fluid.
- Line 20 PROCESS CONN--Enter the size and type of the process connection.
- Columns The columns can accommodate listing more than one pressure switch per page.

ITEM NO.--This is the contract item number and will be filled in by procurement personnel.

INSTRUMENT NO.--Enter the unique identification (UNID) number.

QTY--Give the quantity of units with this number.

SERVICE - ADJ RANGE--Specify the range over which the set point can be adjusted. Be sure to specify the units of measurement. If you cannot list these units at the top of the column, put a number in the parentheses and add the information under a numbered note.

SERVICE - FLUID--Enter the material that is being monitored.

SERVICE - TEMP AMB MAX--Enter maximum ambient temperature. Remember that pressure switches should be isolated from the process temperature by a sensing line.

SERVICE - PRESS MAX--Give maximum design pressure.

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SWITCH - QTY and FORM--Give the number of switches in each instrument and the configuration of the poles, such as 1 - DPDT or 2 - SPST.

SWITCH - CONTACT RATING - AMP, VOLT, and AC or DC--Give the required contact rating for the service, such as 0.1, 140, DC or 5, 120, AC. This may require both minimum and maximum contact ratings in order to satisfy both electrical and mechanical requirements.

SWITCH TRIP POINT, PRESS, INCR DECR, OPEN CLOSE--Enter the range in engineering units within which the switch must trip.

Note: This includes the required trip point and repeatability; it is not the adjustable range of the switch.

SWITCH RESET POINT, FIXED PRESS, ADJUSTABLE, RANGE, REPEAT-ABILITY--Enter the reset point for a fixed reset point. This range must include the required repeatability of the switch reset point. If the reset point must be field adjustable, list the adjustable reset range and repeatability.

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### B8.0 PRESSURE GAUGES (TVA-10581-08)

Before completing this data sheet, the designer should review ANSI B40.1-1980, "Gauges - Pressure and Vacuum - Indicating Dial Type - Elastic Element".

Lines 1-3, 6-8, and 11 should be filled out in accordance with the instructions in section B1.0.

Line 4 - TVA PIPE CODE--Enter the TVA pipe code.

Line 5 - SEISMIC CATEGORY--Mark the seismic category. Category 1(L) is the highest level of seismic qualification for a pressure gauge.

Line 9 - CASE MATL--Check the required case material.

Line 10 - WINDOW MATL--Check the required window material.

Line 12 - PULSATION DAMPING--If pulsation damping is required mark "yes", otherwise mark "no."

Line 13 - DIAL: DIA & COLOR. 4-1/2", BLACK ON WHITE--The 4-1/2" size dial and black numberals on white background are standard.

Make changes only for engineering reasons.

Line 14 - ACCURACY GRADE--Enter an accuracy grade from table 08.

TABLE 08 Accuracy Grades

| Accuracy<br>Grade | Lower 1/4<br>of Scale | Permissible Error<br>(% OF Span)<br>Middle 1/2<br>of Scale | Upper 1/4<br>of Scale |
|-------------------|-----------------------|------------------------------------------------------------|-----------------------|
| 4 <b>A</b>        |                       | 0.1                                                        |                       |
| 3 <b>A</b>        |                       | 0.25                                                       |                       |
| 2A                |                       | 0.5                                                        |                       |
| A                 | 2.0                   | 1.0                                                        | 2.0                   |
| В                 | 3.0                   | 2.0                                                        | 3.0                   |
| С                 | 4.0                   | 3.0                                                        | 4.0                   |
| D -               |                       | 5.0                                                        | ·                     |

Source: ANSI 840.1-1980

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Line 16 - ELEMENT TYPE. BOURDON--Change this only if a bourdon is not satisfactory.

Line 17 - WS PARTS MATL--Enter the material required for the socket and bourdon element, such as bronze, steel, or 316SS.

Line 18 - % OVERRANGE--Enter the amount of overrange required without damaging the gauge. If not significant or none is required, write "MS."

Line 19 - BLOWOUT PROTECTION. SOLID FRONT--If solid front is not available, specify "back" for blowout back or "disc" for a blowout disc in back or side. If gauge is surface mounted, be sure surface has a hole to permit functioning of blowout protection feature.

Line 20 - CONNECTION: 1/2" BACK--The 1/2" back is most common for panel or rack mounting. If some other size or position is required, strike "1/2" BACK" and specify your requirements.

Columns - The columns can accommodate listing more than one pressure gauge per page.

ITEM NO.--This is the contract item number and will be filled in by procurement personnel.

 $\label{localization} \textbf{INSTRUMENT NO.--Enter the unique identification (UNID)} \\ \textbf{number}.$ 

QTY--Enter the quantity of units with this number.

RANGE--Enter the minimum and maximum points on the scale.

REMARKS--List accessories such as siphons, snubbers, or diaphragm seals. Be sure to give complete details, and if more room is needed used footnotes.

MODEL BID and UNIT PRICE--These columns are to be filled in by the vendor when he submits his proposal.

| TVA                                                                                                     | 10       | 1820 | -08 (EN DES-2-8                  | 84)          | REQUISITION NO.                         |                |                                       |             |                                                  |  |  |  |  |  |  |  |
|---------------------------------------------------------------------------------------------------------|----------|------|----------------------------------|--------------|-----------------------------------------|----------------|---------------------------------------|-------------|--------------------------------------------------|--|--|--|--|--|--|--|
|                                                                                                         |          | П    | ITEM NO.                         |              |                                         |                |                                       |             |                                                  |  |  |  |  |  |  |  |
|                                                                                                         |          | 2    | QUANTITY<br>INSTRUMENT NO.       |              |                                         |                |                                       |             |                                                  |  |  |  |  |  |  |  |
| $\vdash$                                                                                                |          | [3]  | INSTRUMENT NO.                   |              | TRUE HAP AND US                         |                |                                       |             |                                                  |  |  |  |  |  |  |  |
| -                                                                                                       |          | 1    | TVA PIPE CODE                    | 5 V          | (TVA USE ONLY) ( )1(L) ( )NA            |                |                                       |             |                                                  |  |  |  |  |  |  |  |
| $\vdash$                                                                                                |          |      | SEISMIC CATEGO<br>ASME CODE CLAS |              | ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) |                |                                       |             |                                                  |  |  |  |  |  |  |  |
| H                                                                                                       |          | 1    | MANUFACTURER                     | 2            | 1 /IIC                                  |                |                                       |             |                                                  |  |  |  |  |  |  |  |
| Н                                                                                                       |          | ŧά   | MODEL NO.                        |              | <del> </del>                            |                |                                       |             |                                                  |  |  |  |  |  |  |  |
|                                                                                                         | ₹        | 9    | CASE MATL                        |              | ( )PHENOL                               | ( )POLYPROPYLE | NE ( )ALL                             | MINUM ()    | MS                                               |  |  |  |  |  |  |  |
|                                                                                                         | Ĕ.       |      | WINDOW MATL                      |              | ( )PLASTIC ( )SHATTERPROOF GLASS        |                |                                       |             |                                                  |  |  |  |  |  |  |  |
| $\vdash$                                                                                                | GENERAL  | Щ    | MOUNTING                         |              |                                         |                |                                       |             |                                                  |  |  |  |  |  |  |  |
| $\vdash$                                                                                                | _        | 12   | PULSATION DAMP                   | ING          | ( )YES                                  | ( )NO          |                                       |             |                                                  |  |  |  |  |  |  |  |
| Н                                                                                                       |          |      | DIAL: DIA & C<br>ACCURACY GRADE  | (1)          | 4-1/2", BL/                             | ACK ON WHITE   |                                       |             |                                                  |  |  |  |  |  |  |  |
| t                                                                                                       |          | 15   | ACCURACT GRADE                   | 117          |                                         |                |                                       |             |                                                  |  |  |  |  |  |  |  |
|                                                                                                         | 1        |      | ELEMENT TYPE                     |              | BOURDON                                 |                |                                       |             |                                                  |  |  |  |  |  |  |  |
|                                                                                                         | -        | 17   | WS PARTS MATL                    |              |                                         |                |                                       |             |                                                  |  |  |  |  |  |  |  |
| Ш                                                                                                       |          | 18   | * OVERRANGE                      |              |                                         |                |                                       |             |                                                  |  |  |  |  |  |  |  |
| ┝╌┥                                                                                                     |          | 19   | BLOWOUT PROTEC                   | TION         | SOLID FRONT<br>1/2" BACK                |                |                                       |             |                                                  |  |  |  |  |  |  |  |
| TTE                                                                                                     | М        | 201  | CONNECTIONS<br>INSTRUMENT        | T            |                                         |                |                                       | MODEL UNIT  |                                                  |  |  |  |  |  |  |  |
| NO                                                                                                      | 1        |      | NO.                              | QTY          | RANGE                                   | REMARK         | S .                                   | BID         | UNIT<br>PRICE                                    |  |  |  |  |  |  |  |
|                                                                                                         |          |      |                                  |              |                                         |                |                                       |             |                                                  |  |  |  |  |  |  |  |
|                                                                                                         |          |      |                                  |              |                                         |                |                                       |             |                                                  |  |  |  |  |  |  |  |
|                                                                                                         |          |      |                                  | L            |                                         |                |                                       |             |                                                  |  |  |  |  |  |  |  |
| -                                                                                                       |          |      |                                  |              |                                         |                |                                       |             | -                                                |  |  |  |  |  |  |  |
| -                                                                                                       | $\dashv$ |      |                                  | -            |                                         |                |                                       |             |                                                  |  |  |  |  |  |  |  |
|                                                                                                         |          |      |                                  | <del> </del> |                                         |                | · · · · · · · · · · · · · · · · · · · |             | <del>                                     </del> |  |  |  |  |  |  |  |
|                                                                                                         |          |      |                                  |              | · · · · · · · · · · · · · · · · · · ·   |                |                                       |             | <del>                                     </del> |  |  |  |  |  |  |  |
|                                                                                                         |          |      |                                  |              |                                         |                |                                       |             | 1                                                |  |  |  |  |  |  |  |
| <u> </u>                                                                                                | _        |      |                                  |              |                                         |                |                                       |             |                                                  |  |  |  |  |  |  |  |
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GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

ORIG ISSUE 5-15-84 REV NO. REV DATE:

#### B9.0 RECORDERS (TVA-10581-09)1

The first eleven lines should be filled out in accordance with the instructions in section 81.0. Fill out the balance of the sheet as follows:

- Line 12 UNIT WEIGHT--Mark "MS," or if knowledge of the weight is required, then mark an "X" in the box to the left to indicate the bidder is to fill it in.
- Line 13 CONDUIT CONN--Enter the required conduit connection size.
- Line 14 POWER SUPPLY--Enter the power available such as 117V 60Hz 10.
- Line 16 INTERNAL FLEUM--Mark "ye " if internal illumination is required, "no" if it is not required.
- Line 18 CHARTS--Enter quantity of charts required or how long the original quantity should last, such as "1-year supply."
- Line 19 INKSET--Enter amount of ink required or how long the original amount should last, such as "1-year supply." Enter NA if "MARK TYPE" (line 17) was specified as thermal.
- Line 20 AMBIENT TEMP--Enter the ambient temperature limits of the area where this equipment will be installed. If device is designated Class 1E refer to section B30.0 before completing this form.
- Line 21 CHART SIZE--Enter the width if strip chart, or diameter if circular.
- Line 22 CHART STYLE--Mark "strip" or "circular."
- Line 23 CHART SPEED--Give the speed in inches per unit of time for strip charts or time for one revolution for circular charts.

<sup>1.</sup> Completion of TVA 10581-31 also required (see B31.0).

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ELECTRICAL DESIGN STANDARD DS-E18.3.5

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Lile 24 - CHART MARKING--Designate the graduations such as UNIFORM, SQUARE ROOT, THERMOCOUPLE TYPE, and markings required on the chart, such as "time every 2 hours."

Line 26 - ACCURACY--Enter "See loop data sheet No. XX." (See Section Bl...0)

Line 32 - RESPONSE TIME--Enter the requirement such as "2 seconds full scale."

Line 34 - OVERLOAD--Enter the magnitude and time duration of a possible overload of the input signal.

Line c = (LANTITY TYPE=-1f line 35 was marked "yes" enter the quantity and type (DPDT, SPDT, etc.) of switches required, otherwise enter "NA."

Line 37 - CONTACT RATING--If line 35 was marked "yes" enter the required contact rating.

Lire 39 - INPUT SIGNAL--Enter the range and type of input such as "4-20 ma DC" or "type E thermocouple."

line 40 - INFUT IMPEDANCE--Enter the minimum or maximum impedance as applicable.

Columns - The columns can accommodate listing more than one recorder on one page. The recorders must all be the same type Do not mix recorders with different types of inputs or different sizes and types of charts.

ITEM NO. -- This is the contract item number and will be filled in by procurement personnel.

INSTRUMENT NO.--Enter the unique identification (UNID) number.

QTY--Enter the quantity of units with this number.

NO. OF PENS--Enter the number of inputs. If this is a scanning type, multirecord recorder, change "PENS" to "PTS."

SCALE--Give the minimum and maximum scale values.

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REMARKS--Indicate whether the scale graduaticus are uniform, square root, or thermocouple curve. Also list any accessories or special features which might be required.

MODEL BID and 'NNIT PRICE--These columns are to be filled in by the vendor -hen he submits his proposal.

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| Ť                   | ÷                                                |              |                           |                                               |                                                  |            |                  | Z               | CHART   | \$17E            |                                                   |                                                  |  |  |  |  |
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| $\vdash$            | Ì                                                | - 51         | THETHER                   |                                               |                                                  |            |                  | 123             | CHART   | SPEED            |                                                   |                                                  |  |  |  |  |
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| $\vdash$            | ¥                                                | 44           | MOUNTING                  |                                               |                                                  |            | +-1              | 131             |         |                  |                                                   |                                                  |  |  |  |  |
|                     | GENERAL                                          | ++           | UNIT WEIGH                |                                               |                                                  |            | <del>    =</del> | 132             | OVER    | INSE TIME        |                                                   |                                                  |  |  |  |  |
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| Н                   |                                                  | 13           | POMER SUPP                | 1 V                                           |                                                  |            | 112              | 3               | OVER    | LOAD             |                                                   |                                                  |  |  |  |  |
| $\vdash$            |                                                  | 15           | PUNER SUFF                | <u>- '                                   </u> |                                                  |            | $\Box$           |                 |         |                  | YES                                               | ( )NO                                            |  |  |  |  |
| Н                   |                                                  |              | INTERNAL I                | LIM                                           |                                                  |            | +                | 32              | OUAN    | TITY/TYPE        |                                                   |                                                  |  |  |  |  |
| $\vdash$            |                                                  | 13           | MARK TYPE                 | LLUI                                          | ()INK                                            | ( )THERMAL | 1-1              | 37              | CONT    | ACT RATING       |                                                   |                                                  |  |  |  |  |
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| Н                   |                                                  | 118          | CHARTS                    |                                               |                                                  |            | +-1              | 137             | INPIL   | T SIGNAL         |                                                   |                                                  |  |  |  |  |
| Н                   |                                                  | 133          | INKSET                    | MO                                            | <b></b>                                          |            | +                | 140             | INPIL   | T IMP            |                                                   |                                                  |  |  |  |  |
| <del>لـــا</del>    |                                                  | 150          | AMBIENT TE                | m#r                                           | NO 05 1                                          |            | +                |                 |         |                  | MODEL                                             | UNIT                                             |  |  |  |  |
| ITE                 |                                                  |              | NSTRUMENT                 | 217                                           | NO. OF<br>PENS                                   | SCALE      |                  | 1               | REMARKS | 5                | BID                                               | PRICE                                            |  |  |  |  |
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| NA - NOT APPLICABLE |                                                  |              |                           |                                               |                                                  |            |                  |                 |         |                  |                                                   |                                                  |  |  |  |  |
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GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

ORIG ISSUE: 5-15-84

REV NO.

# B10.0 ALARM SWITCHES (TVA-10581-10)1

The first eleven lines should be filled out in accordance with the instructions in section B1.0.

- Line 13 CONDUIT CONN--Enter the conduit connection size.
- Line 14 ELEC TERM--Enter the type of electrical termination desired such as screw terminals.
- Line 15 SWITCH TYPE--Enter the type of switch output desired such as relay contact, AC output, or solid-state DC or AC switch output.
- Line 16 INTEGRAL ALM LT--Mark "yes" or "no" for an integral alarm light. If "yes," designate the color.
- Line 17 SUPPLY POWER--Enter the power available such as 117V 60 Hz 19.
- Line 18 ISOLATION--Indicate if isolation is required between inputoutput, input-supply, output-supply, or each one from ground.
- Line 19 INPUT SIGNAL--Enter the input signal range (e.g., 4-20 mA, 1-5 Vdc).
- Line 20 AMBIENT TEMP--List the ambient temperature limits of the area where the units will be mounted. If device is designated as Class 1E refer to section B30.0 before completing this form.
- Columns The columns can accommodate listing more than one alarm switch per page.

ITEM NO.--This is the contract item number and will be filled in by procurement personnel.

INSTRUMENT NO.--Enter the unique identification (UNID) number.

QTY--List the quantity of units with this number.

1. Completion of TVA 10581-31 also required (see B31.0).

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GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD D8-E18.3.5

ORIG ISSUE: 5-15-84 REV NO: REV DATE:

SWITCH - QTY and FORM--Give the number of switches in each instrument and the configuration of the poles such as 1 - DPDT or 2 - SPST.

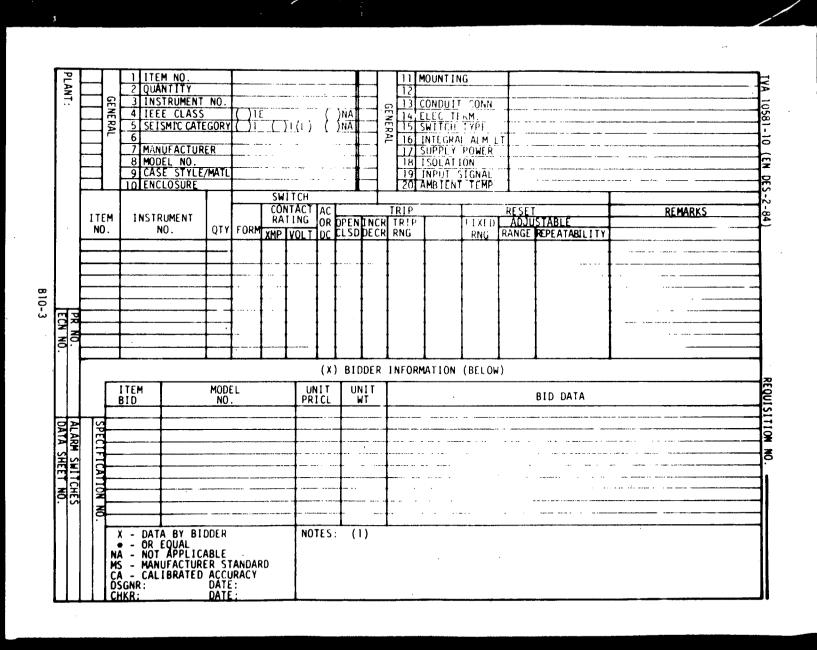
SWITCH - CONTACT RATING - AMP, VOLT, and AC or DC--Specify the required contact rating for the service such as 0.1, 140, DC or 5, 120, AC.

TRIP, OPEN CLOSE, INCR DECR--Specify actuation condition.

TRIP, TRIP RANGE--Specify the trip range in engineering units in terms of the process variable (psig, gpm, deg F, etc.). (Trip range must include repeatability requirements.)

RESET, FIXED RANGE--Enter the range in which reset must occur. Specify the reset range in terms of the process variable. If adjustable reset is required enter "NA."

RESET, ADJUSTABLE, RANGE, REPEATABILITY--If reset must be field adjustable, specify the required reset range and repeatability. Otherwise mark "NA."



GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

ORIG ISSUE: 5-15-84

REV NO. REV DATE:

B11.0 DIFFERENTIAL PRESSURE GAUGES (TVA 10581-11)

Deleted. Refer to B12.0 for specifying differential pressure gauges.

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GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

ORIG ISSUE: 5-15-84

REV NO.

# B12.0 DIFFERENTIAL PRESSURE INDICATING SWITCHES (TVA-10581-12)

The first ten lines (except line 3) should be filled out in accordance with the instructions in section B1.0. Fill out the balance of the sheet as follows:

- Line 3 INDICATING--Specify whether switch is indicating or not by checking the appropriate blank.
- Line 12 WINDOW MATL--Check the required window material if Line 3 was marked "yes".
- Line 13 UNIT WEIGHT--Mark "MS," or if knowledge of the weight is required, mark an "X" in the box to the left to indicate the bidder is to fill it in.
- Line 14 CONDUIT CONN--Give the conduit connection size.
- Line 15 ELEC TERM--Give the type of electrical termination desired such as screw terminals.
- Line 16 SWITCHES--Mark "yes" if switches are required, "no" otherwise.
- Line 17 INDICATOR ACCURACY--Enter the required accuracy as a percent of full scale if linear or engineering units if square root scale. A reasonable standard for linear scales is ±1 percent.
- Line 19 % OVERRANGE--Enter the maximum overrange the unit must withstand as a percent of full scale without a change in calibration. "Full static pressure" is often available and required.
- Line 20 FLUID--Enter the material in contact with the element, such as raw water or condensate.
- Line 21 PROCESS CONN--Enter the size and type of the process connection.
- Line 22 PULSATION DAMPING--Mark "yes" if pulsation damping is required, otherwise mark "no."
- Columns The columns can accommodate listing more than one switch per page. The parentheses at the tops of the several columns are for footnote numbers to designate units of measurement.
- 1. If used with flow element Form TVA 10581-31 must be completed (see B31.0). B12-1

INSTRUMENTATION AND CONTROLS GROUP:

Preparation of Data Sheets for Purchase Requests TITLE:

ELECTRICAL DESIGN STANDARD DS-E18.3.5

ORIG ISSUE: 5-15-84

REV NO. REV DATE:

ITEM NO. -- This is the contract item number and will be filled in by procurement personnel.

INSTRUMENT NO.--Enter the unique identification (UNID) number.

OTY--Enter the quantity of units with this number.

DIFF RANGE--Enter the range of differential pressure that will be input to the differential pressure indicator/ switch for 0 to 100-percent full-scale. If the switch is used for liquid level, indicate whether wet leg or dry leg and give the distance between taps.

SERVICE - SCALE--Give the minimum and maximum values on the dial.

SERVICE - SCALE TYPE--Enter the type of scale required (linear, square root, etc.).

SERVICE TEMP MAX F and PRESS MAX--Enter the maximum temperature and pressure of the measured variable at the instrument. (Remember condensate legs prevent process temperatures from reaching the instrument.)

SWITCH - QTY and FORM--Enter the number of switches in each instrument and the configuration of the poles such as 1 - DPDT or 2 - SPST. If there are two or more switches with different characteristics shown in the subsequent columns, such as contact rating ac vs dc or action required at different set points, use a separate adjacent line for each switch. If switches are not required, enter "NA."

SWITCH - CONTACT RATING - AMP, VOLT, and AC or DC--Enter the contact rating for the service such as 0.1, 140, DC or 5, 120, AC. This may require both minimum and maximum contact ratings in order to satisfy both electrical and mechanical requirements. If switches are not required, enter "NA."

TRIP, OPEN CLOSE, INCR DECR, RANGE--Specify switch trip condition and range (in engineering units) under which trip must occur in terms of the process variable (gpm, ft/sec, psid, etc.). Trip range must include repeatability. Enter "NA" if no switches are required.

RESET, FIXED, RANGE--Enter the range (in engineering units) in which reset must occur in terms of the process variable. Enter "NA" if switches are not required.

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REV NO. REV DATE:

RESET, ADJUSTABLE, RANGE, REPEATABILITY--If field adjustable reset is required, specify the adjustable range and repeatability in engineering units.

|                  | PLANT:              | GENERAL                                    | 8 MODEL NO<br>9 CASE STY<br>10 ENCLOSUE<br>11 MOUNTING      | ( )YES<br>( )1E<br>( )1 | SEF                   | VICE       | NO<br>NA<br>NA<br>NA | GENERAL PRESS | 13 UN<br>14 CO<br>15 EL<br>16 SW<br>17 IN<br>18<br>19 :<br>20 FL<br>21 PR<br>22 PU | NDOW IT WE NDUIT EC TE ITCHE DR AC OVERR. UID OCESS LSATION | I GHT CONN RM. S CURAC ANGE CONN DAMP | Y      | SWITCH AC TRIP RESET |       |        |      |         |                   |  | TVA 10581-12 (EN DES-2-84) |                 |
|------------------|---------------------|--------------------------------------------|-------------------------------------------------------------|-------------------------|-----------------------|------------|----------------------|---------------|------------------------------------------------------------------------------------|-------------------------------------------------------------|---------------------------------------|--------|----------------------|-------|--------|------|---------|-------------------|--|----------------------------|-----------------|
| ECN NO.<br>B12-4 |                     | NO.                                        | ITEM MODE BID NO.                                           |                         | ( )                   | ( ) TYPE F |                      | F             |                                                                                    | QTY                                                         | FORM AMP                              |        |                      |       |        |      |         | RANGE RANGE RANGE |  |                            | REQUI           |
|                  | INDICATING SWITCHES | SPECIFICATION NO.<br>DIFFERENTIAL PRESSURE | X - DATA BY - OR EQUA NA - NOT APP MS - MANUFAC WS - WETTED | L<br>LICABLI<br>TURER : | :<br>ST <b>AN</b> DAR | D          | NOTES:               | : (1)         | INCI                                                                               | LUDE                                                        | 3-VAL                                 | VE MAI | NIFO                 | LD FO | R EACH | SWIT | TCH ASS | SEMBLY            |  |                            | REQUISITION NO. |

ΙVΛ

GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

ORIG ISSUE: 5-15-84

REV NO:

#### B13.0 TEMPERATURE SWITCHES (TVA-10581-13)

The first eleven lines (except line 3) should be filled out in accordance with the instructions in section B1.0. Fill out the balance of the sheet as follows:

- Line 3 INDICATING--Mark "yes" . I an indicating switch is required, otherwise mark "no."
- Line 12 UNIT WEIGHT--Mark "MS," or if knowledge of the weight is required, then mark an "X" in the box to the left to indicate the bidder is to fill it in.
- Line 13. CONDUIT CONN--Enter the conduit connection size.
- Line !4 ELEC TERM--Enter the type of electrical termination desired, such as screw terminals.
- Line 15 SWITCH TYPE--Enter the type of switch desired. (Mercury is not allowed in nuclear plants.)
- Line 16 ACCURACY--Enter the required accuracy as a percent of full scale. A reasonable standard is ±1 percent.
- Line 17 REPEATABILITY--Enter the required repeatability as a percent of full scale. A reasonable standard is 0.2 percent.
- Line 18 ELEMENT--Enter the type of element, such as bimetallic or liquid filled. If the element is long distance type, refer to element data sheet form TVA-10581-29 and fill it out as a supplement to this sheet. Place the note "see sheet 2" in this space. The supplemental sheet should have the same data sheet number as the sheet but listed as sheet 2.
- Line 19 WELL--If the switch requires a well, refer to the element sheet and fill in the appropriate specifications. Enter "see sheet 2" as above for Line 18. If no well is required enter NA.
- Line 20 PROCESS CONN--Enter the size and type of the process connection.
- Columns The columns can accommodate listing more than one temperature switch per page. The parentheses at the tops of the several columns are on footnote numbers to designate units of measurement.

GROUP: INSTRUMENTATION AND CONTROLS

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ELECTRICAL DESIGN STANDARD DS-E18.3.5

ORIG ISSUE: 5-15-84

REV NO.

REV DATE:

ITEM NO.--This is the contract item number and will be filled in by procurement personnel.

INSTRUMENT NO. -- Give the unique identification (UNID) number.

QTY--Enter the quantity of units with this number.

SERVICE - ADJ RANGE--Enter the range over which the set points can be adjusted. Be sure to specify the units of measurement. If you cannot list these units at the top of the column, then put a number in the parentheses and add the information under a numbered note.

SERVICE - SCALE--Enter scale range if indicating (see line 3), therwise leave blank.

SERVICE - FLUID--Enter the material being monitored.

SERVICE - TEMP MAX--Give maximum design pressure.

SERVICE - PRESS MAX--Give maximum design pressure.

SWITCH - QTY and FORM--Enter the number of switches in each instrument and the configuration of the poles such as 1 - DPDT or 2 - SPST. If there are two or more switches with different characteristics shown in the subsequent columns, such as contact rating ac vs dc or action required at different set points, use a separate adjacent line for each switch.

SWITCH - CONTACT RATING - AMP, VOLT, and AC or DC--Enter the required contact rating for the service such as 0.1, 140, DC or 5, 120, AC. This may require both minimum and maximum contact ratings in order to satisfy both electrical and mechanical requirements.

SWITCH - DEAD BAND - MIN, FIX, and ADJ--This is the switch differential--the difference in measurement between the make and break of the switch contacts. Under "MIN" give the minimum differential required; then check whether this differential should be "fixed" or "adjustable."

SWITCH - ACTION - OPEN CLOSE and INCR DECR--Select the desired switch action such as switch "open" on temperature "increase."

SWITCH - TRIP POINT - PRESS and INCR DECR--Enter the temperature at which the switch action is to occur and choose increasing or decreasing measurement.

ITITEM NO. MOUNT ING 2 QUANTITY UNIT WEIGHT CONDUIT CONN 3 INDICATING 4 TEEE CLASS TIE )NA 14 ELEC TERM. 5 SEISMIC CATEGORY 15 SWITCH TYPE 6 ASME CODE CLASS 16 ACCURACY 17 REPEATABILITY 7 MANUFACTURER 8 MODEL NO. 18 ELEMENT 19 WELL 9 CASE/STYLE/MATL 20 PROCESS CONN 10 ENCLOSURE SERVICE TEMP PRESS. MAX MAX SWITCH SCALE RANGE (1) CONTACT RATING AC OR INSTRUMENT ADJ RANGE ( ) DEAD BAND ITEM FLUID OPEN INCR STGT CLOSE DECR ( ) INCR QTY FORM NO. NO. AMP VOLT DC MIN FIX ADJ (X) BIDDER INFORMATION BELOW UNIT PRICE UNIT MODEL ITEM BID DATA BID NO. TEMPERATURE SWITCHE DATA SHEET NO. X---DATA BY BIDDER

---OR EQUAL
NA--NOT APFLICABLE
MS--MANUFACTURER STANDARD
WS--WETTED SURFACE NOTES: (1) SCALE RANGE LISTED FOR INDICATING SWITCHES ONLY.

10581-13 Ê DES-2-84)

**ENGR:** 

DATE:

REQUISITION

GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

ORIG ISSUE 5-15-84

REV NO. REV DATE:

#### BI4.0 CONTROL VALVES (TVA-10581-14)

The first eight lines should be filled out in accordance with the instructions in section B1.0. Fill out the balance of the sheet as follows: (If the information is immaterial, write "MS" and place an "X" in the box to the left to indicate the bidder is to fill it in.)

- Line 9 SERVICE--Designate the application in concise, descriptive terms, such as heater 4 LCV and air preheater TCV.
- Line 10 ACTION/INPUT SIGNAL--Enter the valve action, such as throttling, off-on, 3-way pressure reducing, back pressure, or relief. Also, list the input signal from the controller, such as 3 to 15 psig, 4 to 20 mAdc or self op (self operated).
- Line 11 LINE SIZE/SCHEDULE/MAT'L--Enter the nominal line size, schedule, and pipe material of the line in which the value will be used. If schedule is unknown or special, give wall thickness or ID.
- Line 12 MAX LINE PRESS (PSIG) -- Designate the <u>design pressure</u> for the line.
- Line 13 MAX ... (VLV CLOSED)--Designate the maximum differential pressure that may occur. It is usually at the time the valve is closed.
- Line 14 MAX TEMP & RADIATION--Enter the maximum design temperature and the maximum total integrated radiation expected.
- Line 15 SIZE/STYLE--Designate the body size and style only if necessary. Otherwise mark "MS" and have the bidder specify.
- Line 16 ANSI CLASS/MATERIAL--Enter the ANSI class and material for the body as required. Otherwise, mark "MS" and have the bidder specify.
- Line 17 END CONNECTIONS--Designate the desired end connection, such as screwed, socket weld, flanged, or butt weld.
- Line 18 BONNET TYPE--Designated the bonnet type as required; otherwise mark "MS" and have the bidder specify. Specify extension and finned type or bellows sealed when required.
- Line 19 PACKING--If not "MS," specify any special packing or bellows sealed when required.
- Line 20 LEAKOFF CONNECTIONS--Designate where leakoff connections are to be made, if required; otherwise mark "NA."

  B14-1

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GROUP: INSTRUMENTATION AND CONTROLS

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ELECTRICAL DESIGN STANDARD DS-E18.3.5

ORIG ISSUE: 5-15-84

REV NO:

Line 21 - MAX ALLOW SOUND LEVEL (dBA)--Enter max allowable sound level dBA 3 feet from pipe and 3 feet downstream of the valve outlet.

- Line 22 FLOW CHARACTERISTIC--Specify the desired characteristic such as linear, equal percentage, parabolic, quick opening.
- Line 23 MATERIAL--Enter the material such as hardened stainless steel, stellite, or MS.
- Line 24 NO. OF PORTS/PORT SIZE--Designate single or double ports and whether full size, reduced trim, or MS.
- Line 25 GUIDING--Designate any special requirements, such as stellite or MS.
- Line 26 SPECIAL TRIM--Designate any special requirements, such as stellite or MS.
- Line 27 SEAT LEAKAGE (ANSI/FCI 70-2) CLASS--Designate the seat leakage requirements by class in accordance with ANSI/FCI 70-2 or mark "MS."
- Line 28 TYPE--Designate the type of actuator such as diaphragm and spring, double acting cylinder, electric motor operated, electric solenoid, or electrohydraulic.
- Line 29 SIZE & STROKE--Designate any special features, otherwise mark "MS."
- Line 30 SUPPLY--Designate the range of motive power such as the available air pressure if pneumatic and the voltage and frequency if electric.
- Line 31 FAILURE POSITION--Designate open, closed, or last position.
- Line 32 MANUFACTURER & MODEL--For the positioner, when supplied, give the manufacturer and model number desired, otherwise mark "MS" and have the vendor supply the information.
- Line 33 BYPASS/GAUGES--Specify "yes" or "no" and the number of gauges required. Remember that if the range of operation of the spring and diaphragm is significantly different from the control signal, the bypass and gauges are useless.

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- Lines 34 & 35 FOR INPUT OF VALVE SHALL BE--These two lines in conjunction with line 31 define the true operational operational characteristics of the valve. Specify that the valve shall be opened or closed under inputs of minimum and maximum values of the input signal. For instance, with a failure position of closed, for an input signal of "3 psi," valve shall be "open." This describes a valve common in heating applications.
- Line 36 FILTER RGLTR--For an accessory item specify when a filter-regulator is required. A typical standard is Fisher 67FR-35. This has a metal filter element and a 0- to 30-psig output gauge.
- Line 37 SUPPLY GAUGE--If a supply gauge is required enter "yes" and indicate location (i.e., "separate" or "integral" {if supplied as an integral part of the regulator]). An integral supply gauge shall be specified for all valves used for "on-off" service.
- Line 38 LIMIT SWITCHES--Designate any required limit switches such as "DPDT each limit" or "SPDT open limit."
- Line 39 L.S. CONTACT RATING--Designate the required contact rating on the limit switch, such as "0.1 ampere, 140Vdc" or "5 amperes, 120V, 60Hz." This may require both minimum and maximum contact ratings in order to satisfy both electrical and mechanical requirements.
- Line 40 SOLENOID VALVE--Designate the manufacturer and model number of the desired solenoid valve. Designate "yes" if bidder is to supply his standard valve or "no" if not required.
- Line 41 S.V. COIL VOLTAGE--Be certain to designate the operating voltage available for the solenoid valve.
- Line 42 MANUAL OVERRIDE--Designate what manner of manual override is required, if any.
- Line 43 Although this line is blank, this should be used for special conditions. For instance, if a controller is to be mounted on this valve, use this space to reference the data sheet where the controller is described.
- Line 44 FLOWING MEDIUM--Enter the fluid flowing. Be specific such
   as "saturated steam" (and its quality), "raw cooling water,"
   or "instrument air."

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- Line 45 SIZING CONDITIONS--These are the column headings for the sizing conditions at maximum, normal, and minimum flow.
- Line 46 FLOW RATE--Enter the maximum and minimum controlled flow
- Line 47 PRESSURE (PSIA)  $(P_1)$ --Enter the operating absolute pressures under the maximum, normal, and minimum flow conditions.
- Line 48 TEMPERATURE (F):-Enter the operating temperatures under the maximum, normal, and minimum flow conditions.
- Line 49 \( \Delta P \) (PS1)--Enter the operating differential pressures available for use by the valve under the maximum, normal, and minimum flow conditions.
- Line 50 CV (CALC)--Enter the calculated CV for both the maximum and minimum flow conditions (to be completed by the procuring branch).
- Line 51 CV (ACTUAL) -- This is for the bidder to show the actual CV of the valve he is offering.
- ${
  m NOTE}(2)$  Mark "yes" if the outlet pressure  $(P_2)$  is ever greater than the inlet pressure  $(P_1)$ , and mark "no" if not. If "yes" is marked, the following should be given in the notes section.
  - (a) The value of the inlet and outlet pressure (PSIA) that gives the maximum pressure drop in the reverse direction.
  - (b) The leakage requirements in the reverse direction.
  - (c) Any flow requirements in the reverse direction.

TVA 10581-14 (EN DES-2-84) REQUISITION NO. TITEM NO. MER DATA (IF APP) QUANTITY INSTRUMENT NO 2 JUAN 117
3 INSTRUMENT NO.
4 JEEE CLASS (1)
5 SEISMIC CAYEGORY
6 ASME CODE CLASS
7 MANUFACTURER
8 MODEL NO.
9 SERVICE
10 ACTION/INPUT SIGNAL
11 LINE SIZE/SCHEDULE/MAT'L
12 MAX LINE PRESS (PSIG)
13 MAX LINE PRESS (PSIG)
13 MAX LINE PRESS (PSIG)
13 MAX LINE PRESS (PSIG)
14 JAX TEMP & RADIATION
15 SIZE/STYLE
16 ANSI CLASS/MATERIAL
17 END CONNECTIONS
18 BONNET TYPE
19 PACKING
20 LEAKOFF CONNECTIONS
21 FAX ALLOW SOUND LEVEL (dBA)
22 FLOW CHARACTERISTIC
23 MATERIAL
24 NO. OF PORTS/PORT SIZE
25 GUIDING
26 SPECIAL TRIM
27 SEAT LKG (ANSI/FCT 70-2)
28 TYPE NA NA NA 2 27 SEAT LKG (ANSI/FCI 7)
28 TYPE
29 SIZE & STROKE
30 C PPLY
31 FAILURE PUSITION
32 MANUFACTURER & MODEL
33 BYPASS/GAUGES
34 FOR INPUT OF
35 VALVE SHALL BE
36 FILTER-RGLTR
37 SUPPLY GAUGE
38 LIMIT SWITCHES
39 L.S. CONTACT RATING
40 SOLENOID VALVE
41 S.V. COIL VOLTAGE
42 MANUAL OVERRIDE CLASS 42 MANUAL OVERRIDE 44 FLOWING MEDIUM 44 FLOWING MEDIUM
45 SIZING CONDITIONS AT
46 FLOW RATE
47 PRESSURE (PSIA) (P1)
48 TEMPERATURE (F)
49 AP (PSI)
50 CV (CALC)
51 CV (ACTUAL) MAX FLOW NOR FLOW MIN FLOW MAX FLOW NOR FLOW MIN FLOW NA NA NA NOTE: (1) ELECTRICAL ACCESSORIES ONLY X---DATA BY BIDDER (2) SPECIAL CONDITION: P2 > P1. YES NO ... ---OR EQUAL NA--NOT APPLICABLE P2 (PSIA) =, P1 (PSIA) = MS--MFR STANDARD DSGNR: DATE: CHKR: DATE: SPECIFICATION NO. PR NO. PLANT: CONTROL VALVES

ECN NO.

DATA SHEET NO.

GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

ORIG ISSUE: 5-15-84

REV NO:

# B15.0 EMF TO CURRENT CONVERTER (TVA-10581-15)1

The first eleven lines should be filled out in accordance with the instructions in section B1.0. Fill out the balance of the sheet as follows:

- Line 12 UNIT WEIGHT--Mark "MS," or if knowledge of the weight is required, mark an "X" in the box to the left to indicate the bidder is to fill it in.
- Line 13 CONDUIT CONN--Enter the conduit connection size.
- Line 14 POWER SUPPLY--117V 60Hz is standard on this data sheet. If another voltage is to be supplied by TVA, blank out the 117V - 60Hz and fill in the correct value.
- Line 18 POWER REQ--Enter the maximum allowable power required (watts) by the instrument.
- Line 20 AMBIENT TEMP--Enter the ambient temperature limits of the area where this equipment will be installed. If device is designated as class 1E (line 4) refer to section B30.0 before completing this form.
- Line 23 INPUT/GRD ISOL--Mark "yes" if isolation between the input and ground is required; mark "no" or "MS" if not.
- Line 24 INPUT/OUT ISOL--Mark "yes" if isolation between the input and output is required; mark "no" or "MS" if not.
- Line 25 OUTPUT/GRD ISOL--Mark "yes" if isolation between the input and output is required; mark "no" or "MS" if not.
- Line 28 SENS LINEARIZE--Mark "yes" if sensor linearization is required; mark "no" if not.
- Line 30 TC BURNOUT--Designate upscale or downscale action for an open circuit on the input.
- Line 33 SPAN ADJ--Mark "yes" or "no".

<sup>1.</sup> Completion of Form TVA 10581-31 also required (see B31.0).

GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

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REV NO.

Line 35 - REF JUNCTION--If used as a thermoucouple transmitter, designate compensated or noncompensated. Otherwise mark "NA".

Line 36 - INPUT IMP--If the device must interface with existing equipment, enter the required maximum, minimum, or range in ohms of the input impedance, such as 1000 ohms maximum, 500 ohms minimum, or 500 to 1000 ohms. If the entire loop is being procured enter, "see Loop Data sheet (No.)."

Line 37 - INPUT SIGNAL--Enter the input signal, such as 1 to 5 volts, 0 to 100 mVdc.

Line 38 - F/C TYPE--Enter the ISA thermocouple type (T, J, etc.) or mark "NA" as appropriate.

Line 39 - OUTPUT IMP--Same as line.36 except for the output.

Line 40 - OUTPUT SIGNAL--Enter required output signal, usuall, 4 to 20 mA dc.

Columns - The columns can accommodate listing more than one EMF to current converter per page.

ITEM NO.--This is the contract item number and will be filled in by procurement personnel.

INSTRUMENT NO.--Enter the unique identification (UNID) number.

QTY--Give the quantity of units with this number.

RANGE--Enter the minimum and maximum input voltage or minimum and maximum temperature span (thermoucouple transmitter only).

REMARKS--List accessories such as mounting equipment. Be sure to give complete details. If more room is needed, use footnotes.

REDUISITION NO. TVA 10581-15 (EN DES-2-84) 21 22 23 INPUT/GND ISOL 24 INPUT/OUT ISOL 25 OUTPUT/GND ISOL TITEM NO. 2 QUANTITY
3 INSTRUMENT NO.
4 IEEE CLASS ()1E ()NA
5 SEISHIC CATEGORY ()1 ()1(L) ()NA 26 7 MANUFACTURER
8 MODEL NO.
9 CASE STYLE/MATL
10 ENCLOSURE
11 MOUNTING
12 UNIT WEIGHT
13 CONDUIT CONN
14 POWER SUPPLY 27
28 SENS LINEARIZE ()YES
29
30 TC BURNOUT
31 ZERO ADJ NO 32 33 SPAN ADJ 34 117V. 60HZ 35 REF JUNCTION
36 INPUT IMPD
37 INPUT SIGNAL
38 T/C TYPE
39 OUTPUT IMPD
40 OUTPUT SIGNAL ( )NA 18 POWER REQ 20 AMBIENT TEMP INSTRUMENT 0 UNIT PRICE MODEL ITEM REMARKS RANGE BID NO. NO. X---DATA BY BIDDER NOTES: (1) ---OR EQUAL NA--NOT APPLICABLE MS--MFR STANDARD DSGNR: DATE: DATE: CHKR: SPECIFICATION NO. EMF TO CURRENT CONVERTER DATA SHEET NO. PR NO PLANT: ECN NO.

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GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

ORIG ISSUE: 5-15-84

REV NO:

# B16.0 DIFFERENTIAL PRESSURE TRANSMITTER (ELECTRONIC) (TVA-10581-16)

The first eleven lines should be filled out in accordance with the instructions in section B1.0.

#### NOTE

This data sheet is to be used for differential pressure transmitters only. For absolute or gauge pressure transmitters, use TVA-10581-23.

- Line 12 UNIT WEIGHT--Mark "MS," or if knowledge of the weight is required, then mark an "X" in the box to the left to indicate the bidder is to fill it in.
- Line 13 CONDUIT CONN--Enter the conduit connection size.
- Line 14 POWER SUPPLY--List the available power supply specifications including tolerances. For example 24  $\pm$  2Vdc (loop).
- Line 15 TRANS TYPE--Mark "2-wire" or "4-wire."
- Line 18 POWER REQ--Enter the maximum AC power available in watts (if applicable).
- Line 20 ELEC CONN--Enter the type electrical connections desired, such as screw terminals.
- Time 21 PROCESS CONN--Enter the size and type of process connection, such as 1/4" 18 NPT F.
- Line 22 WS PARTS MATL--Enter the material of construction for parts in contact with process fluid, such as 394SS.
- Line 23 OVERRANGE PROT--Enter the amount of overrange required without damaging the transmitter. If not significant or none is required, write "MS."
- Line 24 3-VALVE MANIFOLD--If a three-valve manifold is required mark "yes"; also list ASME Code Class (line 6).
- Line 25 VIBRATION--Enter the estimated acceleration and frequency of anticipated vibration. Mark "NA" if vibration is insignificant.

<sup>1.</sup> Completion of Form TVA 10581-31 also required (see B31.0).

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GROUP: INSTRUMENTATION AND CONTROLS

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Line 30 - AMBIENT TEMP--Enter the ambient temperature limits of the area where devices will be mounted. If the device is designated as Class IE, refer to section B30.0 before completing this form.

Line 39 - OUTPUT/GRD ISOL--Mark "yes" if output ground isolation is required, "no" or "MS" if not.

Line 41 - RESPONSE TIME--Enter the requirement, such as "2 seconds full scale."

Line 48 - REMOTE AMPL--Mark "yes" if the amplifier must be mounted remote from the detector, otherwise mark "no."

Line 51 - ZERO ADJ--Designate the required zero scale adjustment as plus or minus percent of span or MS.

Line 53 - SPAN ADJ--Enter the minimum and maximum span adjust range in engineering units.

Line 54 - INTEG SQ RT--If an integral square root converter is required, mark "yes," otherwise mark "no."

Line 55 - PULSE DMP ADJ--If adjustable pulsation damping is required
mark "yes," otherwise mark "no."

Line 58 - LOAD IMPD RANGE--Show the load impedance range that the transmitter might be required to operate in as a result of anticipated future loop modifications i.e., addition or removal of an instrument from the loop. If no future loop modifications are anticipated, enter "see Loop Data Sheet (No.)."

Line 60 - OUTPUT SIGNAL--Enter the output signal such as 4 to 20mAdc.

Columns - The columns can accomodate listing more than one transmitter per page.

ITEM NO.--This is the contract item number and will be filled in by procurement personnel.

INSTRUMENT NO.--Enter the unique identification (UNID) number.

QTY--Enter the quantity of units with this number.

DIFF PRESS RANGE--Enter the minimum and maximum points on the range and include units (psid, IN WC, etc.).

IVA

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TITLE: Preparation of Data Sheets for Purchase Requests

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REV NO: REV DATE:

DESIGN PRESS--Enter the design pressure and include units (psig, psia, etc.).

ACTION--Enter "direct" or "reverse".

REMARKS--List accessories such as siphons, 3-valve manifolds, or diaphragm seals. Be sure to give complete details, including material and code class, and if more room is needed use footnotes.

MODEL BID and UNIT PRICE--These columns are to be filled in by the vendor when he submits his proposal.

REQUISITION NO. TVA 10581-16 (EN DES-2-84) 31 TITEM NO. 32 2 QUANTITY 33 3 INSTRUMENT NO. 4 IEEE CLASS 5 SEISMIC CATEGORY NA 35 36 37 38 )1(L) )NA 6 ASPE CODE CLASS (1) )NA 7 MANUFACTURER 8 MODEL NO. 39 OUTPUT/GRD ISOL 9 CASE STYLE/MATE 41 RESPONSE TIME 42 43 44 45 10 ENCLOSURE 11 MOUNTING 12 UNIT WEIGHT
13 CONDUIT CONN
1: POWER SUPPLY 15 TRANS TYPE ()2-WIRE ()4-WIRE 46 47 17 48 REMOTE AMPL 18 POWER REQ 49 19 20 ELEC CONN 51 ZERQ ADJ 52 53 SPAN ADJ 54 INTEG SQ RT 21 PROCESS CONN 22 WS PARTS MATL 23 OVERRANGE PROT 24 3-VALVE MANIFOLD ( 1YES 25 VIBRATION 26 NO ( )NO 55 PULSE DMP ADJ )NO 56 57 58 LOAD IMPD RANGE 28 29 60 OUTPUT SIGNAL 30 AMBIENT TEMP MODEL DIFF PRESS. INSTRUMENT ITEM **ACTION** DESIGN PRESS. 014 NO. NO. (1) 3-VALVE MANIFOLD ONLY IF REQUIRED (SEE LINE 24) X---DATA BY BIDDER NOTES: \*---OR EQUAL (2) NA -- NOT APPLICABLE MS--MFR STANDARD WS--WETTED SURFACE DATE: DSGNR: SPECIFICATION NO DATE: CHKR: DIFFERENTIAL PRESSURE TRANSMITTER (ELECTRONIC) PR NO PLANT: DATA SHEET NO. ECN NO

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GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

ORIG ISSUE: 5-15-84

REV NO.

## B17.0 ELEC TO ELEC INDICATING CONTROLLER (TVA-10581-17)

The first eleven lines should be filled out in accordance with the instructions in section B1.0.

- Line 12 UNIT WEIGHT--Mark "MS," or if knowledge of the weight is required, mark an "X" in the box to the left to indicate the bidder is to fill it in.
- Line 13 CONDUIT CONN--Enter the connection size for the conduit.
- Line 14 POWER SUPPLY--Enter the power available such as 117V 60Hz 10.
- Line 15 ELEC CONN--Enter the type electrical connections desired, such as screw terminals.
- Line 16 POWER REQ--Enter the maximum power required in watts.

  This would usually be listed by the bidder.
- Line 17 TRANS PWR SUP--If a transmitter power supply is required mark "yes" and list the supply voltage required, otherwise mark "no."
- Line 21 AMBIENT TEMP--Enter the ambient temperature limits of the area where the units will be mounted. If the device is designated as Class 1E (line 4), refer to section 130.0 before completing this form.
- Line 22 AUTO-MAN SW--Mark "yes" if automatic-manual switch is required, "no" if it is not.
- Line 23 DEVIATION METER--Mark "yes" if a deviation meter is required, "no" if it is not.
- Line 24 DEVIATION ALARM--Mark "yes" if a deviation alarm is required, "no" if it is not.
- Line 25 PROCESS IND--Mark "yes" or "no".
- Line 26 OVERRANGE PROT--Enter the amount of overrange required without damaging the instrument. If not significant or none is required, write "MS."

<sup>1.</sup> Requires completion of form TVA 10581-31 (see section B31.0).

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ELECTRICAL DESIGN STANDARD DS-E18.3.5

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- Line 27 LEGEND PLATE--List the units  $\alpha {\bf f}$  measure, such as gpm and multiplier, if used.
- Line 28 INDIC LIGHTS--Mark "yes" and color if indicator lights are required, "no" if they are not.
- Line 29 SET-PT SCALE LG--Enter minimum scale length required for the set-point scale.
- Line 31 IND ACCURACY--Enter the required process indicator accuracy in engineering units. If no indicator is required enter "NA".
- Line 32 SETPOINT ACCURACY--Enter the required accuracy of the setpoint:
- i.ine 33 DEAD BAND--Give the maximum tolerable range through which an input can be varied without initiating change in output as percent of span. If deadband is required for control stability, enter the adjustment range (in percent of input span).
- Line 34 DEAD TIME--Give the maximum interval of time acceptable between initiation of an input change and the start of the resulting response.
- Line 39 CONTROL ACTION (2)--Mark "Direct" or "Reverse."
- the 40 PROP BAND ADJ--Enter the proportional band adjustment desired, such as 1 to 300 percent.
- Line 41 RESET ADJ--Enter the reset rate adjustment desired, such as 0.5 to 25 repeats per minute.
- Line 42 RATE ADJ--Enter the derivative rate adjustment desired, such as 0.5 to 25 minutes.
- Line 43 ANTI WINDUP--All electronic controllers should have anti-reset windup as a standard feature.
- Line 44 REMOTE SETPOINT--Mark "yes" if a remote setpoint capability
   is required.
- Line 45 INPUT/GRD ISOL--Mark "yes" if input ground isolation is required, "no" or "MS" if not.
- Line 46 INPUT/OUT ISOL--Mark "yes" if input and output isolation is required, "no" or "MS" if not.

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Line 47 - OUTPUT/GRD ISOL--Mark "yes" if output ground isolation is required, "no" or "MS" if not.

Line 52 - SPAN ADJ--Enter the minimum span adjustment as percent of span if required, otherwise MS.

Line 53 - ZERO ADJ--Designate the required zero scale adjustment as plus or minus percent of span or MS.

Line 56 - INPUT SIG--Enter the input signal, such as 4 to 20mAdc.

Line 60 - OUTPUT SIGNAL--Enter the required output signal, such as 4 to 20mAdc

Columns - The columns can accommodate listing more than one controller per page.

ITEM NO.--This is the contract item number and will be filled in by procurement personnel.

 $\label{localization} \textbf{INSTRUMENT NO.--Enter the unique identification (UNID)} \\ \textbf{number.}$ 

QTY--Enter the quantity of units with this number.

MODES--Give the operation modes such as "P" for proportional, "PI" for proportional plus integral, "PD" for proportional plus derivative, and "PID" for proportional plus integral plus derivative.

 $\ensuremath{\mathsf{MEAS}}$  SCALE--Enter the minimum and maximum values of the scale.

SCALE TYPE--List linear, SQR RT, or special.

REMARKS--List accessories such as mounting equipment. Be sure to give complete details, and if more room is needed use footnotes.

MODEL BID and UNIT PRICE--These columns are to be filled in by the vendor when he submits his proposal.

REQUISITION NO. TVA 10581-17 (EN DES-2-84) 31 IND ACCURACY
32 SET POINT ACCURACY
33 DEADBAND
34 DEADTIME 1 ITEM NO.
2 QUANTITY
3 INSTRUMENT NO.
4 IEEE CLASS
5 SEISMIC CATEGORY ( ) 1 ( ) 1 (L) 7 MANUFACTURER 8 MODEL NO. 9 CASE STYLE/MATL NEMA 39 CONT ACTION (2) ( ) DIRECT ( )REV 10 ENCLOSURE 41 RESET ADJ 42 RATE ADJ 43 ANTI WINDUP 11 MOUNTING 12 UNIT WEIGHT 13 CONDUIT CONN 14 POWER SUPPLY YES 44 REMOTE SET POINT 45 INPUT/GRD ISOL 15 ELEC CONN 46 INPUT/OUT ISOL 16 POWER REQ 17 TRANS PWR SUP 47 OUTPUT/GRD ISOL 48 REPEATABILITY ( )YES VDC()NO 19 20 21 AMBIENT TEMP 22 AUTO-MAN SW YES YES YES 52 SPAN ADJ 53 ZERO ADJ 54 TNO 23 DEVIATION METER 24 DEVIATION ALARM TNO NO 25 PROCESS IND YES NO 26 OVERRANGE PROT
27 LEGEND PLATE
28 INDIC LIGHTS
29 SET-PT SCALE LG 56 INPUT SIG 57 ( )YES COLOR: ( )NO 58 OUTPUT SIGNAL 30 60 MEAS SCALE SCALE MODEL INSTRUMENT ITEM PRICE BID MODES QTY X---DATA BY BIDDER (1) PROCESS INDICATOR ONLY NOTES: \*---OR EQUAL (2) SHALL BY FIELD REVERSIBLE NA--NOT APPLICABLE MS--MFG STANDARD SPECIFICATION NO. DATE: ENGR: ELEC TO ELEC CONTROLLER DATA SHEET NO PLANT:

VA

GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

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### B18.0 PNEUMATIC CONTROLLER (TVA-10581-18)

The first eleven lines should be filled out in accordance with the instructions in section B1.0.

- Line 12 UNIT WEIGHT--Mark "MS," or if knowledge of the weight is required, then mark an  $\beta$ " in the box to the left to indicate the bilder is to fill it in.
- Line 13 INDICATING--Mark "yes" or "no."
- Line 15 SUPPLY AIR--Enter the actual supply air, such as 70 to 100 psig.
- Time 16 IN-OUT CONN--Give the connection size for the input and output supply lines, such as 1/4" NPTF.
- Line 17 INDIC SCALE LG--Enter the desired length for indicator scale (if applicable).
- Line 18 AIR CONSUMED--Enter the maximum amount of air usage, such as 0.5 SCFM, or place an "X" to the left for the manufacturer to specify.
- Line 19 AMBIENT TEMP--Enter the ambient temperature limits of the area where the units will be mounted,
- Line 21 AIRSET--Mark "yes" if air set is to be supplied by vendor, "no" if not required.
- Line 22 SUPPLY GAUGE--Mark "yes" if supply gauge is required, "no" if not required.
- Line 23 OUTPUT GAUGE--Mark "yes" if output gauge is required, "no"
   if not required.
- Line 29 MOUNTING KIT--Designate if an accessory mounting kit is required for special mounting, such as on a valve.
- Line 30 AUX NAMEPLATE--Designate if an auxiliary nameplate is required and what it will have on it. If more space is required, use notes.
- 1. Requires completion of Form TVA 10581-31 (see B31.0).

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- Line 31 ELEMENT TYPE--Enter the type of element such as bellows, bourdon, helical, or diaphragm.
- Line 35 OVERRANGE PROT--Enter the amount of overrange required without damaging the unit. If not significant or none is required, write "MS."
- Line 39 WS PARTS--Enter the material required for the socket and bourdon element, such as bronze, steel, or 316SS.
- Line 42 HYSTERESIS--Maximum incremental hysteresis difference between the upscale and downscale indications of the measured signal during a full-range traverse for a given input, such as 0.2 percent of span.
- Line 45 RESPONSE TIME--Enter the requirement, such as "2 seconds
  tull scale."
- Line 46 SENS.TIVITY--Enter the required sensitivity. A reasonable standard is 0.1 percent of span.
- Line 47 SPAN ADJ--Enter the minimum span adjustment as percent if required, otherwise "MS".
- . Line 49 ZERO ADJ--Designate the required zero scale adjustment as plus or minus percent of span or "MS".
- Line 51 AUTO-MAN TRANS--Mark "yes" if an automatic-manual transfer switch is desired, "no" if not required.
- Line 52 CONTROL ACTION--Mark "direct" or reverse."
- Line 53 MODES OF CONT--Enter the operation modes such as "P" for proportional, "PI" for proportional plus integral, "PD" for proportional plus derivative, and "PID" for proportional plus integral plus derivative.
- Line 54 PROP BAND ADJ--Enter the proportional band adjustment desired, such as 1 to 300 percent.
- Line 55 RESET ADJ--Enter the reset rate adjustment desired, such as 0.5 to 25 repeats per minute.
- Line 56 RATE ADJ--Enter the derivative rate adjustmen desired, such as 0.5 to 25 minutes.
- Line 57 OUTPUT SIGNAL--Give the output signal such as 3 to 15 psig.

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Columns - The columns can accommodate listing more than one controller per page.

ITEM NO.--This is the contract item number and will be filled in by procurement personnel.

INSTRUMENT NO. -- Give the unique identification (UNID) number

QTY--Enter the quantity of units with this number.

INPUT SIGNAL--Enter the input signal such as 3 to 15 psig.

MEAS INCR OUTPUT--Designate whether output should increase or decrease with measurement increase.

MEAS SCALE--Enter the minimum and maximum values of the scale.

SCALE TYPE--List linear, SQR RT, or special.

REMARKS--List accessories. Be sure to give complete details. If more room is needed use footnotes.

MODEL BID AND UNIT PRICE--These columns are to be filled in by the vendor when he submits his proposal.

| TVΔ             | 10                 | 581-18 (EN D                                         | ES-2-84       | 1)             |              |               | F        | EQU!                                             | ISITI                | ON NO.                                           |              |                                                  |
|-----------------|--------------------|------------------------------------------------------|---------------|----------------|--------------|---------------|----------|--------------------------------------------------|----------------------|--------------------------------------------------|--------------|--------------------------------------------------|
| <del>'''</del>  | <del>.</del>       | 1 LITEM NO.                                          | 7             | 4              |              |               | 31       | ELEI                                             | MENT                 | TYPE                                             |              |                                                  |
| -+              | ŀ                  | 2 QUANTITY                                           |               |                |              |               | 32       |                                                  |                      |                                                  |              |                                                  |
|                 |                    | 3 INSTRUMEN                                          | T NO.         |                |              | ELENENT       | 33       |                                                  |                      |                                                  |              |                                                  |
|                 | اپ                 | 4                                                    |               |                |              | =             | 34       |                                                  |                      | SE PROT                                          |              |                                                  |
|                 | ≥                  | 5 SEISMIC CA                                         | TEGORY        | ( )1           | (L)()NA      |               |          | OVE                                              | <u>rran(</u>         | SE PROT                                          |              |                                                  |
|                 | GENERAL            | 6                                                    |               |                |              | ≿             | 36<br>37 |                                                  |                      |                                                  |              |                                                  |
|                 | 3                  | 7 MANUFACTU                                          | RER           |                |              | <b>₩</b>      | 37       |                                                  |                      |                                                  |              |                                                  |
|                 |                    | 8 MODEL NO.                                          |               |                |              | P. 184        | 38       |                                                  | PART!                |                                                  |              |                                                  |
|                 |                    | 9 CASE STYL                                          | E/MATL        |                |              | <b>⊢</b> •    | 39       | M2                                               | PART:                | <del>}                                    </del> |              |                                                  |
|                 |                    | 10 ENCLOSURE                                         |               |                |              | _             | 40       | ├                                                |                      |                                                  |              |                                                  |
|                 |                    | 11 MOUNTING                                          |               |                |              | ⊢             | 41       | HVC                                              | TEDE                 | -10                                              |              |                                                  |
| Ш               |                    | 12 UNIT WEIG                                         | HT.           | / \vre         | / \          | ك إا          | 145      | 1112                                             | TERE                 | 212                                              |              |                                                  |
| -               |                    | 13 INDICATIN                                         | G             | YES            | ()NO         |               | 143      |                                                  |                      |                                                  |              |                                                  |
| $\vdash$        |                    | 14                                                   |               |                |              | <del> </del>  | 175      | DEC                                              | DONS                 | E TIME                                           |              |                                                  |
| $\vdash$        | u.                 | 15 SUPPLY AIR<br>16 IN-OUT CONN<br>17 INDIC SCALE LG |               |                |              | ⊢⊢I           | 146      | CEN                                              | SITI                 | VITY                                             |              |                                                  |
| -               | CASE               |                                                      |               |                | يز إ         | 177           | SDA      | N AD                                             | 1                    |                                                  |              |                                                  |
| $\vdash$        | ٦                  |                                                      |               |                |              | <del> </del>  | 48       | 31.7                                             | וו אט                | -                                                |              |                                                  |
| $\vdash$        |                    | 18 AIR CONSU<br>19 AMBIENT I                         | EMD .         | <u>^</u>       |              | -   -   -   - | 140      | 7FR                                              | PONS<br>SITI<br>N AD | .1                                               |              |                                                  |
| $\vdash \dashv$ |                    | 20 TEMP EFFE                                         | CT            |                |              | $H^{-}$       | 50       | 1                                                | <u> </u>             |                                                  |              |                                                  |
|                 |                    | 21 AIR SET                                           | <del>''</del> | ( )YES         | ( )NO        |               | 51       | AUT                                              | 0-MA                 | N TRANS                                          | ( )YES       | ( )NO                                            |
| +               |                    | 22 SUPPLY GA                                         | UGE           | YES            | ( )NO        |               | 52       | <b>TCON</b>                                      | TROL                 | ACTION(1)                                        | ( )DIRECT    | ( )REV                                           |
| $\vdash$        |                    | 23 OUTPUT GA                                         | UGE           | 1. 7. = 9      |              |               | 53       | MOD                                              | ES 0                 | F CONT                                           |              |                                                  |
|                 |                    |                                                      |               |                |              |               |          | TPRO                                             | P BA                 | ND ADJ                                           |              |                                                  |
|                 | <b>ACCESSORIES</b> | 24<br>25                                             |               |                |              | ONTRO         | 55       | RES                                              | ET A                 | DJ                                               |              |                                                  |
|                 | S.                 | 20<br>27                                             |               |                |              | LJ á          | 56       | RAT                                              | E AD                 | J                                                |              |                                                  |
|                 | Š                  | 27                                                   |               |                |              | $\square$     | 57       | OUT                                              | PUT                  | SIG                                              |              |                                                  |
|                 | 33                 | 28                                                   |               |                |              | 1             | 58       | Ļ                                                |                      |                                                  |              |                                                  |
|                 |                    | 29 MOUNTING                                          | KIT           |                |              | $\vdash$      | 59       | <b> </b>                                         |                      |                                                  |              |                                                  |
|                 |                    | 30 AUX NAMER                                         |               |                |              | 1             | 60       | -                                                | 1                    |                                                  | MODEL        | 10177                                            |
| ITE             |                    | INSTRUMENT                                           | 2.7           | INPUT          | MEAS INCR    | MEAS<br>SCALI |          | SCA                                              | LL                   | REMARKS                                          | MODEL<br>BID | UNIT<br>PRICE                                    |
| NO              |                    | NO.                                                  | QTY           | SIGNAL         | 001701       | JUALI         |          | +                                                |                      | KEIMKKS                                          | 010          | , INTOL                                          |
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|                 |                    | DATA BY BIDE                                         | DE R          | NOTES:         | (1) SHALL    | BE FIE        | LD       | REVE                                             | ERSIE                | BLE.                                             |              |                                                  |
|                 |                    | OR EQUAL                                             |               |                |              |               |          |                                                  |                      |                                                  |              |                                                  |
|                 |                    | NOT APPLICAL                                         |               | 1              |              |               |          |                                                  |                      |                                                  |              |                                                  |
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| WS              | -                  | WETTED SURFA                                         | ACE           |                |              | •             |          |                                                  |                      |                                                  |              |                                                  |
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GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

ORIG ISSUE: 5-15-84

REV NO:

### B19.0 POWER SUPPLY (TVA-10581-19)1

The first eleven lines should be filled out in accordance with the instructions in section B1.0. Fill out the balance of the sheet as follows:

- Line 12 UNIT WEIGHT--Mark "MS," or if knowledge of the weight is required, then mark an "X" in the box to the left to indicate the bidder is to fill it in.
- Line 13 CONDUIT CONN--Enter the conduit connection size if there is an electrical connection, otherwise mark "NA."
- Line 14 NOM POWER SPLY--117V, 60Hz is standard on this data sheet.

  If another voltage is to be supplied by TVA, blank out the 117" 60Hz and fill in the correct value.
- Line 15 SUPPLY VOLT RNG--Enter the range of input power supply voltage variations.
- Line 16 ELECTRICAL CONN--Enter the type electrical connection desired, such as screw terminals.
- Line 17 FUSE ALARM--Mark "yes" or "MS."
- Line 18 MULT OUTPUT--For multiple loops mark "yes" or "no." If "yes," note how many.
- Line 19 SHORT CIR PRO--Designate if short circuit protection is needed.
- Line 21 AMBIENT TEMP--Give the ambient temperature limits of the area where the units will be mounted. If device is designated as class 1E refer to paragraph B30.0 before completing this form.
- Line 22 AMB TEMP EFF--Give the maximum deviation tolerable with changes in ambient temperature, such as ±1 percent per 100 F.
- Line 24 EFFICIENCY--Enter the required efficiency in percent or mark "MS."
- Line 28 INPUT/GRD ISOL--Mark "yes" if isolation between the input and ground is required; mark "no" if not, or "MS."

<sup>1.</sup> Requires completion of form TVA 10581-31 (see B31.0).

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GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

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Line 29 - IN/OUTPUT ISOL--Mark "yes" if isolation between the imput and output is required; mark "no" if not, or "MS."

- Line 30 OUT/GRD ISOL--Mark "yes" if isolation between the output and ground is required; mark "no" if not, or "MS."
- Line 31 OUTPUT RIPPLE--Enter the maximum amount of output ripple that can be tolerated as a percent of output, such as <1 percent of output.
- Line 32 OUTPUT--Enter the maximum and minimum current at the maximum and minimum voltage such as 10mA at 84V to 50mA at 76V. If the voltage is of not significance, simply give the desired output current, such as 10 to 50mAdc or 4 to 20mAdc into the load of 600 ohms.
- Line 36 REGULATION--Enter the maximum tolerable output voltage deviation with the expected load change.
- Line 37 ONV PROT--If overvoltage protection is required, specify "yes" and the setpoint, otherwise mark "MS."
- Line 39 SUP VOLT EFF--Enter maximum tolerable deviation of output caused by changes in supply voltage, such as ±10 percent change in supply voltage causes ±.01% change in output.
- Columns The columns can accommodate listing more than one power supply per page.

ITEM NO.--This is the contract item number and will be filled in by procurement personnel.

INSTRUMENT NO. -- Enter the unique identification (UNID) number.

QTY--Enter the quantity of units with this number.

REMARKS--List any accessories that may be needed. Be sure to give complete details, and if more room is needed, use footnotes.

MODEL NO. and UNIT PRICE--These columns are to be filled in by the vendor when he submits his proposal.

| TVA 105  | 81-19 (EN DES-2-84                                       | <b>(</b> )                                       |              |                 |              | REQUISITION NO.                       |                                       |                                                  |
|----------|----------------------------------------------------------|--------------------------------------------------|--------------|-----------------|--------------|---------------------------------------|---------------------------------------|--------------------------------------------------|
| 1177     | TITEM NO.                                                | <u> </u>                                         | 1            |                 | 21           | AMBIENT TEMP                          |                                       |                                                  |
|          | 2 QUANTITY                                               |                                                  | I            |                 | 22           | AMB TEMP EFF                          |                                       |                                                  |
|          | 3 INSTRUMENT NO.                                         |                                                  |              |                 | 23           |                                       |                                       |                                                  |
|          | 4 IEEE CLASS                                             | ()1E ()                                          | NA I         |                 | 24           | EFFICIENCY                            |                                       |                                                  |
| ⊟ ਫ਼     | 5 SMC CATEGORY                                           |                                                  | NA I         |                 | 25           |                                       |                                       |                                                  |
|          | 6                                                        | 1                                                |              |                 | 26           |                                       |                                       |                                                  |
| GENERAL  | 7 MANUFACTURER                                           |                                                  |              |                 | 27           |                                       |                                       |                                                  |
|          | 8 MODEL NO.                                              | 1                                                |              |                 | 28           | INPUT/GRD ISOL                        |                                       |                                                  |
|          | 9 CASE STYLE MATE                                        |                                                  |              |                 | 29           | IN/OUTPUT ISOL                        |                                       |                                                  |
|          | 10 ENCLOSURE                                             |                                                  |              |                 | 30           | OUT/GRD ISOL                          |                                       |                                                  |
|          | 11 MOUNTING                                              |                                                  |              |                 | 31           | OUTPUT RIPPLE                         |                                       |                                                  |
|          | 12 UNIT WEIGHT                                           |                                                  | _#_          | CHARACTERISTICS | 32           | OUTPUT                                |                                       |                                                  |
|          | 13 CONDUIT CONN                                          |                                                  | _            | =               | 33           |                                       |                                       |                                                  |
| $\vdash$ | 14 NOM POWER SPLY                                        | 117V, 60 HZ                                      | —₩—          | IS              | 34           |                                       |                                       |                                                  |
| $\vdash$ | 15 SUPPLY VOLTENO                                        |                                                  | _#           | 8               | 35           |                                       |                                       |                                                  |
| $\vdash$ | 16 ELEC CONN                                             |                                                  | -            | 5               | 36           | REGULATION                            |                                       |                                                  |
| $\vdash$ | 17 FUSE ALARM                                            |                                                  |              | [ ≨             | 3/           | OVV PROT                              |                                       | ·                                                |
| $\vdash$ | 18 MULT OUTPUT                                           |                                                  | -            | ₹               | 38           |                                       |                                       |                                                  |
| $\vdash$ | 19 SHORT CIR PROT                                        |                                                  |              | ٥               |              | SUP VOLT EFF                          |                                       |                                                  |
|          | 20                                                       |                                                  |              | L               | 40           |                                       | MODEL                                 | 1:10177                                          |
| ITEM     | INSTRUMENT                                               |                                                  | RE <b>MA</b> | סעכ             |              |                                       | MODEL<br>NO.                          | UNIT                                             |
| NO.      | NO QTY                                                   | <del> </del>                                     | KLIV         | 1112            |              | <del></del>                           | 110.                                  | 1                                                |
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| OI       | ATA BY BIDDER<br>R EQUAL<br>DT APPLICABLE<br>FR STANDARD | NOTES: (1)                                       |              |                 |              |                                       |                                       |                                                  |
|          | 2.22                                                     | 1                                                |              |                 |              |                                       |                                       |                                                  |
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GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

ORIG ISSUE: 5-15-84 REV NO: REV DATE:

#### B20.0 ELECTRICAL INDICATORS (TVA-10581-20)1

The first ten lines (except line 6) should be filled out in accordance with the instructions in section B1.0. Fill out the balance of the sheet as follows:

- Line 6 ORIENTATION--List "vertical" or "horizontal" (or "NA" for circular meters).
- Line 12 UNIT WEIGHT--Mark "hark," or if knowledge of the weight is required, mark an "X" in the box to the left to indicate the bidder is to fill it in.
- Line 13 CONDUIT CONN--Enter the conduit connection size, if applicable.
- Line 14 ELEC CONN--Enter the type electrical connections desired, such as screw terminals.
- Line 15 INTERNAL ILLUM--Mark "yes" if internal illumination is required, "no" if it is not required.
- Line 16 DISPLY TYPE--Mark either "Analog" or "Digital."
- Line 17 SCALE LENGTH--List the length of scale desired (analog meter only) enter "NA" if meter is digital type.
- Line 18 MIN RESOLUTION--Enter the minimum acceptable resolution in engineering units.
- Line 19 DIGIT TYPE/SIZE--Mark "LED" (light emitting diode) or "LCD" (liquid crystal display) for digital meters; leave blank if meter is analog type (see line 16). Enter the required digit SIZE.
- Line 20 BRIGHTNESS CNTL--Mark "yes" if a brightness control is required (digital meter only); mark "no" if otherwise or if meter is analog type.
- Line 21 ADJ LAG FEATURE--Mark "yes" if an adjustable lag feature (damping) is required, mark "no" otherwise.

<sup>1.</sup> Requires completion of Form TVA 10581-31 (see B31.0).

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GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

5-15-84

ORIG ISSUE: REV NO: REV DATE

- Line 23 BCD OUTPUT--Mark "yes" if a binary coded decimal (BCD) output is required; mark "no" otherwise.
- Line 24 BURDEN DATA--Enter the maximum permissible power consumption in volt-amperes for that instrument such as for ac ammeter 5 amperes: 0.5 VA, 0.5 power factor lagging.
- Line 25 AMBIENT TEMP--Enter the ambient temperature limits of the area where this equipment will be installed. If device is designated as Class IE (line 4) refer to paragraph B30.0 before completing this form.
- one 27 EXT SENSOR--Enter any special sensor to which the meter may be connected such as RTD or type E thermocouple.
- Line 28 INPUT IMPED--Enter the required maximum, minimum, or range in ohms of the input impedance such as 1000 ohms maximum, 500 ohms minimum, or 500 to 1000 ohms. If the information is immaterial mark "MS" and put an "X" in the box to the left.
- Line 30 VOLTAGE TO GRD--Enter the voltage between the meter and ground, such as 600V.
- Line 33 OVERRANGE CAP--The maximum amount of overrange the instrument must withstand without damage. An acceptable value is 120 to 150 percent of input.
- Line 37 SPAN ADJ--Mark the required span adjustment as percent of span. If information is immaterial, write "MS" and place an "X" in the box to the left.
- Line 38 ZERO ADJ--Designate the required zero scale adjustment as plus or minus percent of span or "MS."
- Line 39 VIBRATION--Specify the acceleration and frequency or "NA" if insignificant.
- Columns The columns can accommodate listing more than one vertical scale indicator per page.

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GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

ORIG ISSUE: 5-15-84

REV NO: REV DATE:

ITEM NO.--This is the contract item number and will be filled in by procurement personnel.

INSTRUMENT NO.--Enter the unique identification (UNID) number.

QTY.--Enter the quantity of units with this number.

SCALE LEGEND--Enter the required scale legend.

RANGE--Enter the minimum and maximum points on the scale.

SCALE TYPE--List the type of scale required (i.e., linear, SQR RT, LOG, LN, or special). Explain "Special" in footnotes.

INPUT SIGNAL--Enter input signal, such as 4 to 20mAdc, type E thermocouple, or 115Vac.

REMARKS--Enter any accessories that may be needed. Be sure to give complete details, and if more room is needed, use footnotes.

MODEL BID and UNIT PRICE--These columns are to be filled in by the vendor when he submits his proposal.

| VA 105          | 81-20 (EN DES-2-6                                   | 34)                |                                                  |                                                  |            | REQUISITI                                        | JR NU.       |                                                  | 7 100                                                                       |
|-----------------|-----------------------------------------------------|--------------------|--------------------------------------------------|--------------------------------------------------|------------|--------------------------------------------------|--------------|--------------------------------------------------|-----------------------------------------------------------------------------|
| T               | TITEM NO.                                           |                    | :                                                |                                                  | 21]        | ADJ LAG F                                        | EATURE       | YES                                              | NO                                                                          |
| <b>⊣</b>        | 2TOUANTITY                                          | Ī                  |                                                  |                                                  | 24         | ADJ ALARI                                        |              | YES                                              | ( )NO                                                                       |
| -1 h            | TELEVISION NO.                                      |                    | )                                                |                                                  | 23         | BCD OUTPL                                        | Ţ            | YES                                              | 1 /NU                                                                       |
| ┪╻┢             | 4 TEEE CLASS<br>5 SETSMIC CATEGOR                   | ( )1E              | ( ) NA :                                         |                                                  | <u> 24</u> | BURDEN DA                                        | TA           |                                                  |                                                                             |
| ⊣≅ŀ             | 5 SEISMIC CATEGOR                                   | <b>y( )</b> 1 ( )1 | (L)()MA                                          |                                                  |            | AMBIENT                                          | EMP          |                                                  |                                                                             |
| 네달              | 6 ORIENTATION                                       | 1                  |                                                  |                                                  | 26         |                                                  |              |                                                  |                                                                             |
| GENERAL         | 7 MANUFACTURER                                      |                    |                                                  |                                                  | 27         | EXT SENSO                                        | <u> </u>     |                                                  |                                                                             |
| -1 ° 1          | 8 MODEL NO.                                         | 1                  |                                                  |                                                  | 28         | INPUT IM                                         | ED           |                                                  |                                                                             |
| <b>⊣</b> }      | 9 CASE STYLE MAT                                    | d                  |                                                  |                                                  | 29         | SHIELDING                                        | <u> </u>     |                                                  |                                                                             |
| 7               | 10 ENCLOSURE                                        |                    | ł                                                |                                                  | 30         | <b>YOLTAGE</b>                                   | O GND        |                                                  |                                                                             |
| $\dashv$        | 11 MOUNTING                                         |                    |                                                  |                                                  | 31         |                                                  |              | ļ                                                |                                                                             |
| 7 1             | 12 UNIT WEIGHT                                      |                    |                                                  | <u> </u>                                         | 32         |                                                  |              |                                                  |                                                                             |
| <b>-1</b>       | 13 CONDUIT CONN                                     |                    |                                                  | CHARACTERISTICS                                  | 33         | OVERRANG                                         | CAP.         | <b> </b>                                         |                                                                             |
| <b>□</b> 1      | 14 FLEC CONN                                        |                    |                                                  | <u> </u>                                         | 34         |                                                  |              | <b></b> _                                        |                                                                             |
|                 | 15 INTERNAL ILLU                                    | 4 ( )YES           | ( )NO                                            | <u> </u>                                         | -22        |                                                  |              |                                                  |                                                                             |
|                 | 16 DISPLY TYPE                                      | ( )ANALO           | G()DIGITAL                                       |                                                  | -39        | SPAN ADJ                                         |              |                                                  |                                                                             |
| _] [            | 17 SCALE LENGTH                                     |                    |                                                  | ≸                                                | 3/         | SPAN AUU                                         |              |                                                  |                                                                             |
| _               | 18 MIN RESOLUTIO                                    | N .                |                                                  | <u></u> -  ₹                                     | -22        | ZERO ADJ                                         | <u> </u>     | <del> </del>                                     |                                                                             |
|                 | 19 DIGIT TYPE/SIZ                                   |                    | )LCD SIZE:                                       | 니히                                               | 39         | VIBRATIO                                         | <u> </u>     | <del> </del>                                     |                                                                             |
|                 | 20 BRIGHTNESS CN                                    | TES YES            | ( )NO I                                          |                                                  | 40         |                                                  | T            |                                                  | 1                                                                           |
| ITEM            | INSTRUMENT                                          | SCALE              | RANGE                                            | SCALE                                            |            | INPUT                                            | RE-<br>MARKS | MODEL<br>BID                                     | UNIT                                                                        |
| NO.             | NO. QT                                              | LEGEND             | KANGE                                            | TYPE                                             |            | SIGNAL                                           | MAKKS.       | - BIW -                                          | 1.000                                                                       |
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| + - C<br>NA - N | DATA BY BIDDER OR EQUAL HOT APPLICABLE HER STANDARD | NOTE:              | (1)                                              |                                                  |            |                                                  |              |                                                  |                                                                             |
| SGNR:           |                                                     |                    |                                                  |                                                  |            | SPE                                              | CIFICA       | TION NO.                                         |                                                                             |
| CHKR:           | DATE:                                               |                    |                                                  |                                                  |            |                                                  |              | ·                                                |                                                                             |
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GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

J-11-84

ORIG ISSUE REV NO. REV DATE:

# B21.0 BIMETAL THERMOMETERS AND MATING WELLS (TVA-10581-21)

The first ten lines should be filled out in accordance with the instructions in section B1.0.

- Line 14 DESIGN PRESS--Enter the system design pressure.
- Line 15 FLUID--Enter the material in contact with the element or well, such as raw water or condensate.
- Line 21 WELL TYPE--Mark "straight" or "tapered" as applicable.
- Line 22 EXTERNAL CONN--Enter the size connection for external thread or socket weld.
- Line 24 INTERNAL THREAD--Enter the Size connection for the extension nipple or packing nut.
- Line 25 DIMENSION "A" (U)--Enter the insertion length.
- Line 26 DIMENSION "B" (T)--Enter the lagging extension.
- Line 27 OTHER DIMENSIONS--If it is appropriate, give the size of the hex on the well or the outside diameter of the bar stock.
- tine 30 WS MATL--Enter the materials of construction of the well or the wetted surface parts.
- Line 31 DIAL--The 4-1/2" size dial and black numerals on white background are standard.
- Line 32 ELEMENT TYPE--Enter the type of element such as bimetal.
- Line 36 ACCURACY--Give the accuracy. A reasonable standard is 1 percent of span.
- Line 37 % OVERRANGE--Give the amount of overrange required without damaging the thermometer. If not significant or none is required, write "MS."
- Line 38 REPEATABILITY--Enter the repeatability as a percent of full scale. A reasonable standard is 0.5 percent.
- Line 40 VIBRATION EFF--Specify limits of deviation at what frequency and at what magnitude if required, if not, mark "MS."

GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD D8-E18.3.5

ORIG ISSUE: 5-15-64

REV NO: REV DATE:

Columns - The columns can accommodate listing more than one thermometer assembly or test per page.

ITEM NO.--This is the contract item number and will be filled in by procurement personnel.

 $\label{localization} \begin{tabular}{ll} INSTRUMENT NO--Enter the unique identification (UNID) \\ number. Mark all TI's and matching TW's. \end{tabular}$ 

QTY--Enter the quantity of assemblies with this number.

TEMP RANGE--Enter the required temperature range, such as 30 to 130  $\ensuremath{\mathrm{F}}\xspace$  .

FLUID VELOCITY--Enter the maximum velocity in feet per second.

MODEL BID and UNIT PRICE--These columns are to be filled in by the vendor when he submits his proposal.

| TVA 1         | 0581-21 (EN DE | <b>\$-2-8</b> | 4)            |          |               | REQUIST                               | TION NO         |                                                  |          |
|---------------|----------------|---------------|---------------|----------|---------------|---------------------------------------|-----------------|--------------------------------------------------|----------|
| T-            | 1 TEM NO.      | T             |               |          |               | 21 WELL                               |                 | ( STRATCHT                                       | TAPERED  |
|               | 2 QUANTITY     |               |               |          |               |                                       | RNAL THD        |                                                  |          |
|               | 3 INSTRUMENT   | NQ.           |               |          |               | 23                                    |                 |                                                  |          |
| LJ ₹          | 4              |               |               |          |               | 24 INT                                | RNAL THD        | <b></b>                                          |          |
| H &           | 5 SEISMIC CATE | CORY          | $\Omega$      |          | )NA           | 25 DIM                                | NSION "U"       | <b></b>                                          |          |
| ₩.            |                | LASS          |               |          | )NA           | 26 DIM                                | NSION "T"       | <del> </del>                                     |          |
| H°            | L ROMA DE LAN  | K             |               |          |               | 27 OTH                                | R DIM.          | <b></b>                                          |          |
| H             | 8 MODEL NO.    |               |               |          |               | 28<br>29                              |                 | <del> </del>                                     |          |
| H             | 10             |               |               |          |               | 30 WS J                               | 4A T1           | <u> </u>                                         |          |
| <b>}</b>      | 111            |               |               |          |               | 31 DIA                                | TA LL           | <del> </del>                                     |          |
| $\vdash$      | 12             |               |               |          |               | 32 FI F                               | ENT TYPE        | <del>                                     </del> |          |
| $\vdash$      | 131            | _             |               |          |               | 33                                    | 12.17. 0        | <b>†</b>                                         |          |
|               | 14 DESIGN PRES | SS.           |               |          | 1             | 34                                    |                 |                                                  |          |
|               | 15 FLUID       |               |               |          | 1             | 35                                    |                 |                                                  |          |
|               | 16             |               |               |          |               | 36 ACCI                               | JRACY           |                                                  |          |
| $\sqcup$      | 17             |               |               |          | ↓             |                                       | ERRANGE         | L                                                |          |
|               | 18             |               |               |          |               |                                       | ATABILITY       | <b></b>                                          |          |
| $\vdash$      | 19             |               |               |          |               | 39                                    | 1 + 1 0 1 = = = | <b></b>                                          |          |
| TTEN          | 20 I           | <del></del>   | TEMP          |          | 1112          | 1 1401VIB                             | RATION EFF      | MODE:                                            | 1 10:17  |
| ITEM<br>NO.   | INSTRUMENT NO. | QTY           | TEMP<br>RANGE | VELL     | DIU.<br>YTIOC | REMARI                                | <b>(</b> S      | MODEL<br>BID                                     | UNIT     |
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| x -           | DATA BY BIDDER | ≀             | NOTES:        | (1) 1    | THERM         | METERS (MARK                          | "TI"            | ETC.) SHALL                                      | MATE     |
|               | OR EQUAL       |               |               |          | AITH A        | ND FIT IN THE                         | SEPARABLE       | WELL                                             |          |
| NA -          | NOT APPLICABLE | :             |               | (        | (MARK         | "TW," £T(                             | <b>:</b> .)     |                                                  |          |
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| WS -          | WETTED SURFACE | .             |               |          |               |                                       |                 | <u></u>                                          | INE 22   |
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| PLANT         | ſ:             |               |               |          |               |                                       | DATA SUEE       |                                                  |          |

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GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

ORIG ISSUE: 5-15-84

REV NO:

#### B22.0 LIQUID LEVEL GAUGES (TVA-10581-22)

Lines 1-3 and 5-8 should be filled out in accordance with the instructions in paragraph  $1.1\,\mathrm{L}$ 

- Line 11 MOUNTING--Enter "flanged" (include flange type), "threaded" (include thread type and nipple size) or "butt weld" (include nipple size).
- Line 12 UNIT WEIGHT--Mark "MS," or if knowledge of the weight is required, mark an "X" in the box to the left to indicate the bidder is to file it in.
- Line 14 = FLUID--Enter the material in contact with the element, such as raw water or condensate.
- Line 15 MAX PRESS--Give the system design pressure.
- Line 16 MAX TEMP--Give maximum design temperature.
- Line 18 BODY MATL--Give the material of construction for the gauge body.
- Line 20 AMBIENT TEMP--Enter the ambient temperature limits of the area where this equipment will be installed.
- Line 21 VALVE BODY--Enter the material of construction for the gauge valve body.
- Line 22 VALVE BONNET--Enter the type of gauge valve bonnet, such as union or bolted.
- Line 23 VALVE HANDLE--Enter the type of gauge valve handle, such as handwheel.
- Line 24 END CONN--Enter size of end connection, such as 3/4" NPT (male).
- Line 25 VALVE TRIM--Enter the material of construction for the gauge valve trim, such as type 316 stainless steel.
- Line 26 SAFETY CHECK--Mark "yes" if safety ball check is required.

  Mark "no" if ball check is not required.

GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

5-15-84

ORIG ISSUE: REV NO REV DATE

Line 31 - GAUGE TYPE-~Enter type of gauge required, such as reflex or transparent. Most gauges are tubular as opposed to "flat glass." If "flat glass" is desired, say so.

Line 33 - GAUGE CONN--Enter type of connection required--flanged, screwed, end, side, or back-connected. Also list size, such as 3/4" NPT (female).

Line 34 - DRAIN--Enter drain size, such as 1/2" NPT, if required.

Line 35 - VENT--Enter vent size, such as 1/2" NPT, if required.

Line  $3\sigma$  - TANK CONN--Enter tank or vessel connection size and type, such as  $374^{\circ\prime\prime}$  male.

Line 37 - GLASS--List type of glass required, high pressure or tempered borosilicate.

Line 39 - PROTECTOR--Mark "yes" if protector is required; if not required, mark "no."

Columns - The columns can accommodate listing more than one liquid level gauge per page.

ITEM NO.--This is the contract item number and will be filled in by procurement personnel.

INSTRUMENT NO.--Enter the unique identification (UNID) number.

QTY--Enter the quantity of units with this number.

BODY LENGTH--Give the overall length of body.

VIS LENGTH--Give the length of visible glass.

CONN CENTERS—Give the distance between the centerlines of connections.

REMARKS--List accessories such as end steams, scales, or support brackets. Be sure to give complete details, and if more room is needed use footnotes.

MODEL BID and UNIT PRICE--These columns are to be filled in by the vendor when he submits his proposal.

| VA 10 | 581      | -22 (EN DES-2-8                 | 4)              |                       | ISITION NO                         |                           |                  |  |  |
|-------|----------|---------------------------------|-----------------|-----------------------|------------------------------------|---------------------------|------------------|--|--|
| ή-    | П        | ITEM NO.                        |                 |                       | ANTAE RODA                         |                           |                  |  |  |
| _     | 12       | DUANTITY                        |                 | 22                    | VALVE BONNET                       |                           |                  |  |  |
| 7     | 13       | INSTRUMENT NO.                  |                 | [23]                  | VALVE HANDLE                       |                           |                  |  |  |
| 7 =   | 4        |                                 |                 | 24                    | END COMM<br>VALVE TRIM             |                           |                  |  |  |
| SE PE | 5        | SEISMIC CATEGORY                |                 | 25                    | VALVE TRIM                         |                           |                  |  |  |
| 78    | 6        | ASME CODE CLASS                 | ) NA            | [26]                  | SAFETY CHECK                       |                           |                  |  |  |
| 73    |          | MANUFACTURER                    |                 | 27                    |                                    |                           |                  |  |  |
|       |          | MODEL NO.                       |                 | 28                    |                                    |                           |                  |  |  |
| 7     | 9        |                                 |                 | 29                    |                                    |                           |                  |  |  |
|       | 10       |                                 |                 | 30                    |                                    |                           |                  |  |  |
|       | Ш        | MOUNTING                        |                 |                       | GAUGE TYPE                         |                           |                  |  |  |
|       | 12       | UNIT WEIGHT                     |                 | 32                    | -                                  |                           |                  |  |  |
|       | 13       |                                 |                 |                       | GAUGE CONN                         | <del></del>               |                  |  |  |
|       | 14       | FLUID                           |                 | 134                   | DRAIN                              |                           |                  |  |  |
| _]    | 15       | MAX PRESS.                      |                 |                       | VENT                               |                           |                  |  |  |
| _]    | 16       | MAX TEMP                        |                 |                       | TANK CONN                          | <b></b>                   |                  |  |  |
|       | 17       |                                 |                 | 37                    | GLASS                              |                           |                  |  |  |
|       |          | BODY MATL                       |                 | 38                    | ILLUMINATOR                        |                           |                  |  |  |
|       |          | GASKET MATL                     | <u> </u>        |                       | PROTECTOR                          | <del></del>               |                  |  |  |
|       |          | AMBIENT TEMP                    |                 | 40                    |                                    |                           | T                |  |  |
| ITEM  |          | INSTRUMENT                      | BODY VIS        | CONN                  | DEMARKE                            | MODEL                     | UNIT             |  |  |
| NO.   | <u> </u> | NO. QTY                         | LENGTH LENGTH   | CENTERS               | REMARKS                            | BID                       | PRICE            |  |  |
|       |          |                                 |                 |                       |                                    |                           |                  |  |  |
| NA -  | OR<br>NO | TA BY BIDDER EQUAL T APPLICABLE | NOTES: (1) EACH | GAUGE GLA<br>(COMPLET | SS TO BE SUPPLI<br>E WITH SAFETY C | ED WITH TWO<br>HECKS) AND | GAUGE<br>NIPPLES |  |  |
| DSGN  | R:       | R STANDARD  DATE:               |                 |                       |                                    | 7100 40                   |                  |  |  |
| CHKR  | :        | DATE:                           |                 |                       | SPECIFICA                          | TION NO.                  |                  |  |  |
|       |          |                                 | PR NO           | )                     | LIGHTD LE                          | VEL GAUGES                |                  |  |  |
| PLAN  | T :      |                                 | ECN A           | 10                    | DATA CUE                           | DATA SHEET NO.            |                  |  |  |

IV۸

GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

ORIG ISSUE: 5-15-84 REV NO.

REV DATE

### B23.0 PRESSURE TRANSMITTER (ELECTRONIC) TVA-10581-23)1

The first eleven lines should be filled out in accordance with the instructions in paragraph 1.1 (Do not use this data sheet to specify a differential pressure transmitter; use data sheet TVA 10581-16.)

- Line 12 UNIT WEIGHT--Mark "MS," or if knowledge of the weight is required, mark an "X" in the box to the left to indicate the bidder is to fill it in.
- Line 13 CONDUIT CONN--Enter the conduit connection size for the conduit = 3/4 NPT-F is typical.
- Line 14 POWER SUPPLY--Enter the power supply voltage range. If transmitter is 2-wire, also enter loop.
- Line 17 POWER REQ--If transmitter is 4-wire enter the maximum power required in warts. This would usually be listed by the bidder.
- Line 18 ELEC CONN--Enter the type electrical connections desired, such is screw terminals.
- Line 19 PROCESS CONN--Enter the size and type of process connection, such as 1/4" 18 NPT-F.
- Line 20 WS PARTS MATL--Enter the material of construction for parts in contact with process fluid, such as 304SS.
- Line 21 OVERRANGE PROT--Enter the amount of overrange required without damaging the transmitter. If not significant or none none is required, write "MS."
- Line 22 VIBRATION--Enter the estimated acceleration and frequency, or "NA" if insignificant.
- Line 25 AMBIENT TEMP--Enter the ambient temperature limits of the area where the units will be mounted. If device is designated as Class IE (line 4) refer to section B30.0 before completing this form.
- 1. Requires completion of form TVA 10581-31 (see B31.0).

GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

ORIG ISSUE: 5-15-84

REV NO.

Line 37 - OUTPUT/GRD ISOL--Mark "yes" if output ground isolation is required, "no" or "MS" if not.

Line 40 - RESPONSE TIME--Enter the requirement, such as "2 seconds full scale."

Line 41 - PULSATION DAMPING--Mark "yes" if pulsation damping is required, otherwise mark "no."

Line 44 - SPAN ADJ--Enter the minimum span adjustment as percent of range if required, otherwise "MS."

Line 45 - ZERO ADJ--Designate the required zero scale adjustment as plus or minus percent of range or "MS."

Line 49 - LOAD IMPD RANGE--Enter the desired range of loop impedance that may be required for future addition or deletion of instruments from the loop. If it is not of major concernenter "MS."

Line 50 - OUTPUT SIGNAL--Enter the required output signal, such as 4 to 20mAdc

Columns - The columns can accommodate listing more than one pressure transmitter per page.

ITEM NO.--This is the contract item number and will be filled in by procurement personnel.

INSTRUMENT NO.--Enter the unique identification (UNID) number.

QTY--Enter the quantity of units with this number.

PRESS RANGE--Enter the minimum and maximum points of range. Also enter the units (PSIG, PSIA, etc).

DESIGN PRESS--Enter the maximum design pressure.

REMARKS--List accessories such as siphons or diaphragm seals. Be sure to give complete details. If more room is needed use footnotes.

MODEL BID and UNIT PRICE--These columns are to be filled in by the vendor when he submits his proposal.

| TVA 10      | 0581-23 (EN DE                                   | S-2-8 <b>4</b>                                   | )                                       |                                                  |                  |                                                  |         | ON NO      |            |                                                  |
|-------------|--------------------------------------------------|--------------------------------------------------|-----------------------------------------|--------------------------------------------------|------------------|--------------------------------------------------|---------|------------|------------|--------------------------------------------------|
|             | TITEM NO.                                        |                                                  |                                         |                                                  |                  | 26<br>27                                         | I       |            |            |                                                  |
|             | 2 QUANTITY                                       |                                                  |                                         |                                                  |                  | 27                                               |         |            |            |                                                  |
|             | 31 INSTRUCEN                                     | T NO. I                                          |                                         |                                                  |                  | 28                                               |         |            |            |                                                  |
|             | A TREE ALAS                                      | \$                                               | ( )1E (                                 | )NA                                              |                  | 29                                               |         |            |            |                                                  |
| SENE RA     | 5 SEISMIC CA                                     | TEGORM                                           |                                         | )NA                                              |                  | 30                                               |         |            |            |                                                  |
|             | -6                                               |                                                  |                                         |                                                  |                  | 31                                               |         |            |            |                                                  |
|             | 7 MANUFACTU                                      | RER                                              |                                         |                                                  |                  | 32                                               |         |            |            |                                                  |
|             | 8 MODEL NO.                                      |                                                  |                                         |                                                  |                  | 33                                               |         |            |            |                                                  |
|             | 9 CASESTYLE                                      | MATL                                             |                                         |                                                  |                  | 34                                               |         |            |            | •                                                |
|             | 10 ENCLOSURE                                     |                                                  |                                         |                                                  |                  | 35                                               |         |            |            |                                                  |
|             | 11 MOUNTING                                      |                                                  |                                         |                                                  |                  | 36                                               |         |            |            |                                                  |
|             | 12 UNIT WEIG                                     | HT                                               |                                         |                                                  |                  | 37                                               | OUTPUT/ | GRD ISOL   |            |                                                  |
|             | 13 CONDUIT C                                     | ONN                                              | , , , , , , , , , , , , , , , , , , , , |                                                  |                  | 33                                               |         |            |            |                                                  |
|             | 14 POWER SUP                                     | PLY                                              |                                         |                                                  |                  | 39                                               |         |            |            |                                                  |
|             | 15                                               |                                                  |                                         |                                                  |                  | 40                                               | RESPONS | E TIME     |            |                                                  |
|             | 16                                               |                                                  |                                         |                                                  |                  |                                                  |         | MPING ADJ  | ( 'YES     | ( ) NO                                           |
|             | 17 POWER REQ                                     |                                                  |                                         |                                                  |                  |                                                  | REMOTE  |            |            |                                                  |
|             | 18 ELEC CONN                                     |                                                  |                                         |                                                  |                  | 43                                               |         |            |            |                                                  |
|             | 19 PROCESS C                                     | ONN T                                            |                                         |                                                  |                  |                                                  | SPAN AD | )ປ         |            |                                                  |
| $\Box$      | 20 WS PARTS                                      | MATI T                                           |                                         |                                                  |                  |                                                  | ZERO AL |            |            |                                                  |
|             | 21 OVERRANGE                                     | PROT                                             |                                         |                                                  |                  | 46                                               |         |            | -          |                                                  |
|             | 22 VIBRATION                                     | - 1101                                           |                                         |                                                  | +                | 47                                               | †       |            |            |                                                  |
|             | 23                                               |                                                  |                                         |                                                  |                  |                                                  | LOAD IN | PD RANGE   |            |                                                  |
|             | 24                                               |                                                  |                                         |                                                  |                  | 49                                               |         | II D RANGE |            |                                                  |
|             | 25 AMBIENT T                                     | EMP                                              |                                         |                                                  |                  |                                                  | OUTPUT  | STGNAL     |            |                                                  |
| ITEM        | INSTRUMENT                                       | <b>*</b>                                         | PRESS.                                  | DE                                               | SIGN             | 130                                              | 1001101 | DIGITAL    | MODEL      | UNIT                                             |
| NO.         | NO.                                              | QTY                                              | RANGE                                   |                                                  | ESS.             | 1                                                | REMAR   | rks .      | BID        | PRICE                                            |
|             |                                                  | 1 3                                              |                                         | 1                                                |                  |                                                  |         | ,5         | 0.0        | 1                                                |
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| -           | <u> </u>                                         |                                                  |                                         | L                                                |                  | 1                                                |         |            |            | L                                                |
|             | ATA BY BIDDER                                    |                                                  | NOTES: (1)                              |                                                  |                  |                                                  |         |            |            |                                                  |
|             | R EQUAL                                          | •                                                |                                         |                                                  |                  |                                                  |         |            |            | j                                                |
|             | OT APPLICABLE                                    |                                                  |                                         |                                                  |                  |                                                  |         |            |            | ì                                                |
|             | IFR STANDARD                                     | ļ                                                |                                         |                                                  |                  |                                                  |         |            |            |                                                  |
| WSW         | ETTED SURFACE                                    | 1                                                |                                         |                                                  |                  |                                                  |         |            |            |                                                  |
|             |                                                  |                                                  |                                         |                                                  |                  |                                                  |         |            |            |                                                  |
| DSGNR       | : DATE:                                          | ļ                                                |                                         |                                                  |                  |                                                  |         | CDECTETO   | OH MOTTA   |                                                  |
| 1 23000     |                                                  |                                                  |                                         |                                                  |                  |                                                  |         | I SEELIFIC | CATION NO. |                                                  |
| CHKR:       | DATE:                                            | ŀ                                                | •                                       |                                                  |                  |                                                  |         |            |            |                                                  |
| CHKR:       |                                                  | L                                                | ·                                       | -                                                | חש ממ            |                                                  |         | PRESSURE   | TED /F:F/  | TPONTC                                           |
| 1           |                                                  | L                                                |                                         |                                                  | PR NO.<br>ECN NO |                                                  |         | PRESSURE   | TER (ELEC  | TRONIC)                                          |

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GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

ORIG ISSUE: 5-15-84

REV NO.

### B24.1 SOLENOID VALVES (TVA-10581-24)

The first eleven lines should be filled out in accordance with the instructions in paragraph 1.1. Fill out the balance of the sheet as follows: (If the information is immaterial, write "MS" and place an "X" in the bex to the left.)

- Line 12 UNIT WEIGHT--Mark "MS," or if knowledge of the weight is required, then mark an "X" in the box to the left to indicate the bidder is to fill it in.
- Line 13 ANSI CLASS--Enter the ANSI class for the body material required. Otherwise, mark "MS".
- Line 14 CONDUIT CONN--Enter the conduit connection size.
- Line 15 ELEC CONN--Enter the type of electrical termination desired, such as 18" 1 ad wire.
- Line 16 POWER SUPPLY--Designate the coil voltage and frequency (or DC).
- Line 17 POWER REQ--Designate the maximum power (watts) available if it is a limiting factor, otherwise mark "MS" and have the vendor supply the information.
- Line 18 HEAT RISE--If the heat rise is of concern, designate the maximum, otherwise mark "MS."
- Line 19 RADIATION--Designate the type and amount of radiation expected either as an average rate or as an integrated dose. If device is designated as Class IE (line 4), refer to section B30.0 before completing this entry.
- Line 20 AMBIENT TEMP--Enter the ambient temperature limits of the area where this equipment will be installed. If device is designated as Class IE (line 4) refer to section B30.0 before completing this form.
- Line 21 BODY MATL--Designate the desired body material.
- Line 22 WS PARTS MATL--Designate any special wetted surface parts materials; otherwise mark "MS."
- Line 23 COIL INS--Designate the desired coil insulation class, such as high temperature class H.

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Line 24 - DUTY CYCLE--Designate continuous or "MS."

Line 25 - DISC MATL--Designate the disc material if there are special requirements, otherwise mark "MS."

Line 26 - SEAT MATL--Designate the seat material if there are special requirements, otherwise mark "MS."

Line 27 - LEAKAGE--Designate the maximum allowable leakage rate.

Line 28 - ADJ FLOW--Designate if adjustable flow is required by "yes" or "no." If "yes," indicate whether the needle valves are "integral" or "external."

Line 29 - MAN OVERRIDE--Designate whether manual override is required.

 $L_{\rm TRE}/30$  - PILOT OPER--Designate whether the valve can be pilot operated or not.

Line 31 - LINE SIZE/SCHED--Enter the nominal line size and schedule of the line in which the valve will be used. If schedule is unknown or special, give wall thickness or ID.

Line 32 - MAX LINE PRESS (PSIG)--Designate the design pressure for the line.

Line 33 - RMP POSN IND--Designate any required switches such as "DPDT each limit" or "SPDT open limit".

Line 34 - CONTACT RATING--Indicate contact rating of remote position indication switches. If remote indication is not required (see line 33) mark "NA."

Line 36 - FLOWING MEDIA--Designate the fluid being controlled, such as dry air or instrument air.

Line 37 ~ FLOW RATE--Designate the maximum design rate of flow in SCFM or gpm.

Line 38 - INLET PRESS  $(P_1)$  (PSIA)--Designate the maximum inlet pressure to be expected.

Line 39 - PRESS DROP--Designate the maximum allowable pressure drop at the minimum inlet pressure.

Line 40 - MEDIA TEMP--Enter the minimum and maximum temperatures expected for the flowing media.

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ORIG ISSUE: 5-15-84

REV NO:

Columns - The columns can accommodate listing more than one solenoid valve per page.

lTEM NO.--This is the contract item number and will be filled in by procurement personnel.

INSTRUMENT NO. -- List the unique identification (UNID) number.

QTY--Enter the quantity of units with this number.

NO. OF PORTS--State whether the valve is to have two, three, or four ports.

PRESS RANGE--Enter the minimum and maximum points of range.

DESIGN PRESS--Enter the maximum design pressure.

TAIL POSIT--Designate the position of the valve upon power failure.

END CONN--Designate the type of end connection such as 1/4" NPTF.

 $\mathrm{C}_{\mathrm{V}}$ --Designate the required valve flow constant or mark "MS."

ORIFICE SIZE--Designate the required orifice size if known or mark "MS."

REMARKS--List any special characteristics not specified above. If there is insufficient space, use notes.

MODEL BID and UNIT PRICE--These columns are to be filled in by the vendor when he submits his proposal.

NOTE(1)--Mark "yes" if the outlet pressure  $(P_2)$  is ever greater than the inlet pressure  $(P_1)$ , and mark "no" if not. If "yes" is marked, the following should be given in the "notes" section.

- The value of the inlet and outlet pressures (PSIA) that gives the max pressure drop in the reverse direction.
- (2) The leakage requirements in the reverse direction.
- (3) Any flow requirements in the reverse direction.

| TVA       | 10      | 581      | -24 (EN DES          | -2-8         | 4)                                               |                                                  |                                                  |                                                  |        | REQ                                              | UISITI         | ON NO.                                           |              |                                                  |
|-----------|---------|----------|----------------------|--------------|--------------------------------------------------|--------------------------------------------------|--------------------------------------------------|--------------------------------------------------|--------|--------------------------------------------------|----------------|--------------------------------------------------|--------------|--------------------------------------------------|
|           | 7       |          | ITEM NO.             |              |                                                  |                                                  |                                                  |                                                  |        |                                                  | PODY           |                                                  |              |                                                  |
|           | ľ       | 2        | OUANTITY             |              |                                                  |                                                  |                                                  |                                                  |        | 24                                               | WS PA          | TS MATL                                          |              |                                                  |
|           |         | 3        | INSTRUMENT           | 10.          |                                                  |                                                  |                                                  | $\vdash$                                         |        | 21                                               | COLL           | <b>D</b>                                         |              |                                                  |
|           | ₹I      | 4        | TEEE CLASS           |              | ) IE                                             | 3377                                             |                                                  | $\vdash$                                         | i      |                                                  | DUTY C         |                                                  |              |                                                  |
| $\square$ | ٣.      |          | SEISMICOATE          |              |                                                  | )1(L)                                            |                                                  | Н                                                |        |                                                  | SEAT I         |                                                  |              |                                                  |
| -4        | GENERAL |          | ASME CODE            |              |                                                  |                                                  | □ NA                                             | $\vdash\dashv$                                   |        |                                                  | LEAKAG         |                                                  |              |                                                  |
| Щ'        | ٦١      |          | MANUFACTUR           | ER           |                                                  |                                                  |                                                  | Н                                                |        |                                                  | ADJ FI         |                                                  |              |                                                  |
| $\vdash$  | ŀ       | Ä        | MODEL NO.<br>SERVICE |              |                                                  |                                                  |                                                  |                                                  |        |                                                  |                | VERRIDE                                          |              |                                                  |
| $\vdash$  |         |          | ENCLOSURE/           | MATI         | <del></del>                                      |                                                  |                                                  | Н                                                |        | 30                                               | PILOT          | OPER                                             |              |                                                  |
| $\vdash$  | ⊣       |          | MOUNTING             | WIL          |                                                  |                                                  |                                                  |                                                  |        | 31                                               | LINES          | ZE/SCHED                                         |              |                                                  |
|           |         |          | UNIT WEIGH           | Ť            |                                                  |                                                  |                                                  |                                                  |        | 32                                               | MAXLIN         | EPRESS (PSIG)                                    |              |                                                  |
|           | ı       |          | ANSI CLASS           | ·            |                                                  |                                                  | 1                                                |                                                  |        | 177                                              | RMT P          | OSN IND                                          |              |                                                  |
|           | - 1     |          | CONDUIT CO           | NN           | <u> </u>                                         |                                                  |                                                  |                                                  | z      | 34                                               | CONTA          | CT RATING                                        |              | ( )NA                                            |
|           | 1       |          | ELEC CONN            |              |                                                  |                                                  |                                                  |                                                  | DESIGN | 35                                               |                |                                                  |              |                                                  |
|           | ı       |          | POWER SUPP           | LY           |                                                  |                                                  |                                                  |                                                  | S S    | 36                                               | FLOWI          | NG MEDIA                                         |              |                                                  |
|           | ļ       | 17       | POWER REQ            |              |                                                  |                                                  |                                                  |                                                  | _      | D/                                               | FLOW           | RATE                                             | MAX:         | MTN.                                             |
|           | 1       | 18       | HEAT RISE            |              | I                                                |                                                  |                                                  | $\vdash$                                         |        | Ķ                                                | INLET          | PRESS (P) (PSIA)                                 | MAX:         | MIN:                                             |
| $\square$ |         |          | RADIATION            |              | ļ                                                |                                                  |                                                  |                                                  | l      |                                                  | PRESS<br>MEDIA |                                                  | MAX:         | MIN:                                             |
| لميها     | _       |          | AMBIENT TE           | MP           | 110 00                                           | C A * I                                          | END                                              | +_                                               | L      |                                                  | IFICE          | I CMF                                            | MODEL        | UNIT                                             |
| LTE       |         | I        | NSTRUMENT            | 274          | NO. OF                                           | PAIL                                             | END                                              | C,                                               | ٧      |                                                  | IZE            | REMARKS                                          | BID          | PRICE                                            |
| NO        | •       | -        | <u>NO</u>            | QTY          | PURIS                                            | PU3:1                                            | CUNI                                             | -                                                |        | + -                                              | 141            | KERAKKS                                          | - 5.5        | 1                                                |
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| Χ         | D       | ATA      | BY BIDDER            |              | NOTES                                            | : (1                                             | ) SPEC                                           | IAL                                              | CON    | IDI.                                             | TION:          | P2 > P1, YES                                     | □ N0 C       | )                                                |
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|           |         |          | APPLICABLE           |              |                                                  |                                                  | - '                                              |                                                  | •      |                                                  |                | •                                                |              |                                                  |
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GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

ORIG ISSUE: 5-15-84 REV NO:

REV DATE

### B25.0 ROTAMETERS (TVA-10581-25)

The first nine lines (except line 4) should be filled out in accordance with the instructions in paragraph 1.1. Lines 4 and 10 will be blank.

- Line 11 MOUNTING--Enter "surface" or "line".
- Line 12 UNIT WEIGHT--Mark "MS," or if knowledge of the weight is required, mark an "X" in the box to the left to indicate the bidder is to fill it in.
- Line 14 PIPE CONN/MATL--Enter the pipe connection size and material.
- Lire 15 FRAME STYLE--Enter the frame style, such as "C" for purge meters, or mark "MS."
- Line 16 MULTITUBE PANEL--Enter the multitube panel model number. If none is required, mark "NA."
- Line 17 MANIFOLD CONN--Enter the manifold connection pipe size. If not required, mark "NA."
- Line 18 WS MATL--Enter the materials of construction for parts in contact with the process fluid.
- Line 20 AMBIENT TEMP--Enter the ambient temperature limits of the area where the units will be mounted.
- Line 21 SCALE LENGTH--Enter length of scale.
- Line 22 ACCURACY--Enter the required accuracy. A reasonable standard is 1 percent of span.
- Line 23 FLOAT/MATL--Enter type and material of construction for float.
- Line 24 FLOAT STOPS--Enter the material of construction for float stops or mark "MS."
- Line 25 SEALS/MATL--Enter the type of seal (packing or 0-ring) and the material.
- Line 26 PROT SHIELD--Mark "yes" if protective shield is required.

  Mark "NA" if not required.
- Line 27 INLET VALVE--Mark "yes" if inlet valve is required. Mark "NA" if not required.

IVΑ

GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

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Line 28 - OUTLET VALVE--Mark "yes" if outlet is required. Mark "NA" if not required.

Line 29 - VALVE BODY--Enter the material of construction for the valve body.

Line 30 - VALVE SEAT--Enter the material of construction for the valve seat.

Line 31 - ALARM SW RATING--Enter the alarm switch contact rating when alarm is required. Mark "NA" when alarm is not required.

Line 32 - ALARM SW DIFF--Enter the alarm switch differential when alarm is required. Mark "NA" when alaim is not required.

Line 3° - REPRODUCIBILITY--Enter the required reproducibility as a percent of full scale. A reasonable standard is 0.5 percent.

Line 34 - ELEC CONN--Enter the type of electrical connection desired, such as screw terminals.

Line 35 - CONDUIT CONN--Enter the connection size for the conduit.

Line 37 - RGLTR BODY--Enter the material of construction for the regulatory body if regulatory is required. If not required, mark "NA."

Line 38 - RGLTR DIAPH--Enter the material of construction for the regulator diaphragm, such as viton (with stainless steel body) or Buna N (with brass body). If regulator is not required, mark "NA."

Line 39 - RGLTR TRIM--Enter the material of construction for the regulator trim if regulator is required. If not required, mark "NA."

Line 40 - RGLTR TUBING--Enter the material of construction for the regulator tubing if regulator is required. If not required, mark "NA."

Columns - The columns can accommodate listing more than one rotameter per page.

ITEM NO.--This is the contradt item number and will be filled in by procurement personnel.

GROUP: INSTRUMENTATION AND CONTROLS

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ELECTRICAL DESIGN STANDARD DS-E18.3.5

ORIG ISSUE: 5-15-84 REV NO: REV DATE:

 $\label{local_intermediate} \textbf{INSTRUMENT NO.--Enter} \ \ \textbf{the unique identification (UNID)} \\ \textbf{number.}$ 

QTY--Enter the quantity of units with this number.

CAPACITY - FLOW--Enter the minimum and maximum rate of flow, such as 2-20.

CAPACITY - UNITS--Enter the units of measurement, such as SCFM, SCFH, or  $\mbox{\rm gpm}.$ 

DIFF PRESS--Enter the maximum pressure drop allowable across instrument.

SERVICE-TEMP--Enter the design temperature of the process.

SERVICE-PRESS--Enter the design pressure of the process.

REMARKS--List accessories such as hose connectors, differential pressure regulator, or combination filter-regulator. Be sure to give complete details, and if more room is needed, use footnotes.

MODEL BID and UNIT PRICE--These columns are to be filled in by the vendor when he submits his proposal.

REQUISITION NO. TVA 10581-25 (EN DES-2-84) 21 SCALE LENGTH 22 ACCURACY 23 FLOAT/MATL 24 FLOAT STOPS I TEM NO. 2 QUANTITY 3 INSTRUMENT NO. 5 SEISMIC CATEGORY ( )1(L) 6 ASME CODE CLASS 7 MANUFACTURED 25 SEALS/MATL 26 PROT SHIELD 27 INLET VALVE 28 OUTLET VALVE 8 MODEL NO. 9 CASE STYLE/MATE 29 VALVE BODY 30 VALVE SEAT 31 ALARM SW RATING 11 MOUNTING 12 UNIT WEIGHT 32 ALARM SW DIFF 33 REPRODUCIBILITY
34 ELEC CONN
35 CONDUIT CONN 14 PIPE CONN/MATL 15 FRAME STYLE 16 MULTI TUBE PNL 17 MANIFOLD CONN 36 37 RGLTR PODY 38 RGLTR DIAPH 39 RGLTR TRIM 18 WS MATL 19 40 RGLTR TUBING 20 AMBIENT TEMP CAPACITY DIFF SERVICE MODEL UNIT INSTRUMENT ITEM QT TEMP PRESS. BID PRICE **PRESS** UNITS NO. FLOW NO. X---DATA BY BIDDER NOTES: (1) \*---OR EQUAL NA -- NOT APPLICABLE MS--MFR STANDARD WS--WETTED SURFACE DATE: DSGNR: DATE: CHKR: SPECIFICATION NO. ROTAMETERS PR NO. PLANT: R DATA SHEET NO. ECN NO.

GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

ORIG ISSUE:

5-15-84

REV NO: FIZV DATE:

# R26.0 DISPLACER TYPE (PNEUMATIC) LEVEL CONTROLLER (TVA-10581-26)

The first eleven lines should be filled out in accordance with the instructions in paragraph 1.1.

- Line 12 CASE LOCN--Check "left hand" or "right hand" to indicate on which side of the cage the case should be mounted. A "left hand" case is to the left side of the cage.
- Line 13 UNIT WEIGHT--Mark "MS," or if knowledge of the weight is required, mark an "X" in the box to the left to indicate the bidder is to fill it in.
- Line 14 APPLICATION--list the desired application such as liquid level, specific gravity, control, indication, or transmission.
- Line 16 LIQUID--List the liquid to be measured.
- Line 19 SYSTEM TEMP+-List the design temperature of the system.
- Line 20 AMBIENT TEMP--List the ambient temperature limits of the area where the units will be mounted.
- Line 21 BODY MATL--List the cage body material.
- Line 23 OPR PRESS MAX-MIN--List the maximum and minimum cage operating pressure.
- Line 24 OPR TEMP MAX-MIN--List the maximum and mirimum cage operating temperature.
- Line 25 SPGR AT OPR T-P--List the fluid specific gravity at the operating temperature and pressure.
- Line 28 UPPER CONN--List the required time and size of the upper cage connection such as 2" RFF-150 psi, 2" SW, or 1-1/2" NPTF. Also, indicate its orientation: top, side right, side left, or side back.
- Line 29 LOWER CONN--List the required type and size of the lower cage connection such as 2" RFF-150 psi, 2" SW, or 1-1/2".

  NPTF. Also indicate its orientation: bottom, side right, side left, or side back.

GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

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Line 30 - ROTATABLE HEAD--Mark "yes" if required, "no" or MS"

Line 31 - AIRSET--Mark "yes" if airset is required, "no" if not required. If "yes," describe what is required such as filter-regulator at 20 psig.

Line 32 - SUPPLY GAUGE--Mark "yes" if supply gauge is required, "no" if not required.

Line 34 - SUPPLY PRESS--List the supply pressure.

Line 37 - SWITCHES - FORM--List the number of contacts required and term such as 2SPDT. If none, mark "NA" or "none."

Line 39 - SW RATING--Enter the switch rating, such as 4 amperes at 110Vac.

Line 40 - MEAS INC - CONTACT--Designate whether contact "opens" or closes" on measurement increase.

Line 51 - DISPLACER DIA--Enter the diameter of the displacer, or "MS."

Line 52 - DISPL LENGTH--Enter the displacer length, or "MS."

Line 53 - DISPL MATERIAL--Enter the displacer material, or "MS."

Line 54 - DISPL ROD LENGTH--Enter the length of displacer rod, or "MS."

Line 55 - DISPL ROD MATERIAL -- Enter material of displacer rod, or "MS."

Line 57 - TORQUE TUBE MATL--Enter material of torque tube, or "MS."

Line 59 - COOLING EXTN--For applications at  $over\ 400\ F$ , enter whether or not air fin extension is required.

Line 61 - ACCURACY--Enter the required accuracy. A reasonable standard is 1/2 percent of span.

Line 62 - HYSTERESIS--Maximum incremental hysteresis difference between the upscale and downscale indications of the measured signal during full range traverse for a given input, such as ±0.2 percent of span.

GROUP: INSTRUMENTATION AND CONTROLS

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- Line 63 LINEARITY--Enter the maximum deviation between an average curve and a straight line, usually as plus or minus a percent of span.
- Line 64 REPEATABILITY--Enter the required repeatability. A reasonable standard is 0.1 percent of span.
- Line 65 RESPONSE TIME--Enter the requirement, such as "2 seconds full scale."
- Line 66 SENSITIVITY--Enter the required sensitivity. A reasonable standard is 0.1 percent of span.
- Line 67 .AN ADJ--Enter the minimum span adjustment as a percent if required, "no' if it is not.
- Line 71 IN-OUT CONN--Enter the connection size for the input and output supply lines.
- Line 72 CONTROL ACTION. REVERSIBLE--Nost controllers are reversible in the field. Delete if it is <u>not</u> required.
- Line 73 SUPPLY AIR--Enter the actual supply air for the plant, such as 70-100 psig.
- Line 74 MODES--Enter the operation modes, such as "P" for proportional, "PI" for proportional plus integral, "PD" for proportional plus derivative, and "PID" for proportional plus integral plus derivative.
- Line 75 MEAS INC OUTPUT--Designate whether output should "increase" or "decrease" with measurement increase.
- Line 76 OUTPUT--Enter the required output such as 3 to 15 psi or 6 to 30 psi.
- Line 77 PROP BAND ADJ (P)--Enter the proportional band adjustment desired, such as 20 to 200 percent.
- Line RESET ADJ (1)--Enter the reset rate adjustment desired, such as 0.01 to 1 minute per repeat.
- Line 79 RATE ADJ (D)--Enter the derivative rate adjustment if required. However, derivative is seldom required on this type of liquid level measurement.

GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

ORIG ISSUE: 5-15-84

REV NO:

Columns - The columns can accommodate listing more than one controller per page.

ITEM NO.--This is the contract item number and will be filled in by procurement personnel.

INSTRUMENT NO.--Enter the unique identification (UNID) number.

QTY--Enter the quantity of units with this number.

RANGE OR SPAN--Enter the desired operating range or span.

REMARKS--List accessories such as sight glass or cooling fins. Be sure to give complete details, and if more room is needed, use footnotes.

MODEL BID and UNIT PRICE--These columns are to be filled in by the vendor when he submits his proposal.

| TVA                                              | 105   | 81-26 (EN DES-2                  | -84)         |                                                  | . REQUISITION NO                   |                                                       |                      |              |          |
|--------------------------------------------------|-------|----------------------------------|--------------|--------------------------------------------------|------------------------------------|-------------------------------------------------------|----------------------|--------------|----------|
|                                                  |       | TITEM NO.                        |              |                                                  |                                    |                                                       | 41                   | _            |          |
| $\square$                                        | 17    |                                  |              |                                                  |                                    |                                                       | 42                   | d            |          |
|                                                  | Œ     | N INSTRUMENT NO.                 |              |                                                  |                                    |                                                       | 140                  |              | Ш        |
| H₫                                               |       |                                  |              | 7 77 7 7 7 104                                   |                                    |                                                       | 44                   | Ξ            | Н        |
| H 5                                              | 11 3  | SEISMIC CATEGO                   | <u>RY</u>    | ( )1(L) ( )NA<br>( )NA                           |                                    |                                                       | 45                   | _            | Н        |
| $H_{\overline{e}}$                               | Н     | ASME CÔDE CLÁS<br>MANUFACTURER   |              | 1.700                                            |                                    |                                                       | 46<br>47             | DATA         | Н        |
| H                                                |       | MODEL NO.                        |              | <del>                                     </del> |                                    |                                                       | 48                   | 2            | Н        |
| H                                                | H     | CASE STYLE/MAT                   | L            |                                                  |                                    | <u> </u>                                              | 49                   | Z.           | Н        |
|                                                  | 110   | CASE STYLE/MAT<br>DENCLOSURE     |              |                                                  |                                    |                                                       | 48<br>49<br>50<br>51 | Ī            |          |
|                                                  | Πì    | I MOUNT ING                      |              |                                                  | DISPLACER DIA                      |                                                       | 51                   | _            | Ш        |
|                                                  | L     | CASE LOCK                        |              | (C)[EFICO)RYGHT                                  | DISPL LENGTH                       |                                                       | 52<br>53<br>54<br>5  | Ž.           | Ы        |
| $\vdash$                                         | -     | UNIT WEIGHT                      |              | <u></u>                                          | DISPL MATERIAL<br>DISPL ROD LENGTH |                                                       | 153                  | <u></u>      | Н        |
| 13                                               |       | APPLICATION                      |              |                                                  | DISPL ROD MATE                     |                                                       | 124                  | ELE          | Н        |
| HZ                                               | ۲,    | LIQUID                           |              |                                                  | DISPE ROD MATE                     | <del></del>                                           | 56                   | _            | Н        |
| H                                                | 1     | 1 - 140.15                       |              |                                                  | TORQUE TUBE MATL                   |                                                       | 157                  | MARY         | Н        |
|                                                  | Ш     |                                  |              |                                                  |                                    |                                                       | 57<br>58<br>59       | Ξ            |          |
|                                                  | no    | N CVCTEM TEMP                    |              |                                                  | COOLING EXTN                       |                                                       | [59]                 | PR I         | Ш        |
| $\vdash \vdash$                                  | 120   | AMBIENT TEMP<br>BODY MATL        |              |                                                  | A C C U O A C V                    |                                                       | 160                  | Н            | Н        |
| $\vdash$                                         | 5     | BODY WAIL                        |              |                                                  | ACCURACY<br>HYSTERESIS             |                                                       | 61<br>62             | ⋖            | Н        |
| H                                                | 2     | OPP PRESS MAY                    | _MIN         |                                                  | LINEARITY                          |                                                       | 63                   | PA           | Н        |
| H                                                | 2     | OPR PRESS. MAX<br>OPR TEMP MAX-M | IN           |                                                  | REPEATABILITY                      |                                                       | 64                   | <u>.</u>     | Н        |
|                                                  | 125   | BLSPGR AT OFR T-                 | <b>P</b>     |                                                  | RESPONSE TIME                      |                                                       | 165                  |              | П        |
|                                                  | 26    |                                  |              |                                                  | SENSITIVITY                        |                                                       | [66]                 | RMANC        |          |
| $\square$                                        | 127   | 1                                |              |                                                  | SPAN ADJ                           |                                                       | 67                   |              | П        |
| Н                                                | 2:    | UPPER CONN                       |              |                                                  | 7500 401                           |                                                       | 68                   | 늘            | Н        |
| $\vdash$                                         | 36    | LOWER CONN<br>ROTATABLE HEAD     |              | ( )YES ( )NO ( )YS                               | ZERO ADJ                           |                                                       | 69<br>70             | اسا          | Н        |
| <b>-</b>                                         | H     | AIRSET                           |              | YES ( NO                                         | IN-OUT CONN                        |                                                       | 州                    | $\vdash$     | Н        |
|                                                  | 32    | SUPPLY GAUGE                     |              | 1 1 2 1 1 1 1 1                                  | CONTROL ACTION                     | REVERSIBLE                                            | 72                   | ~            | Н        |
| $\square$ $\sim$                                 | 33    | OUTPUT GAUGE                     |              |                                                  | SUPPLY AIR                         |                                                       | 73                   |              | П        |
| SSORIE                                           | 34    | OUTPUT GAUGE<br>SUPPLY PRESS.    |              |                                                  | MODES                              |                                                       | [74                  | ¥            |          |
| 1                                                | 35    |                                  |              |                                                  | MEAS INC-OUTPUT                    |                                                       | 75                   | اب           | Н        |
| $-1$ $\circ$                                     | 36    | SWITCHES-FORM                    |              |                                                  | OUTPUT                             |                                                       | 76<br>77             | RO           | Н        |
| ACC F                                            | 37    |                                  |              |                                                  | PROP BAND ADJ (P)<br>RESET ADJ (I) |                                                       | 78                   | CONT         | Н        |
|                                                  | 35    | SW RATING                        |              | - <del>-</del>                                   | RATE ADJ (D)                       |                                                       | 79                   | $\mathbb{S}$ | Н        |
|                                                  | 40    | MEAS INC-CONTA                   | CT           |                                                  |                                    | ·                                                     | 80                   |              |          |
| TIE                                              |       | INSTRUMENT                       | OTY          | RANGE OR                                         | REMARKS                            | MODEL                                                 |                      | INI          |          |
| NO                                               | •     | NO.                              | ٧٠.          | SPAN                                             | Ne. VIIII                          | BID                                                   | μ,                   | RI           | LE       |
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|                                                  |       | <u> </u>                         |              |                                                  |                                    |                                                       |                      |              |          |
|                                                  |       | TA BY BIDDER                     |              | NOTES:                                           |                                    |                                                       |                      |              |          |
|                                                  |       | EQUAL                            |              |                                                  |                                    |                                                       |                      |              |          |
|                                                  |       | T APPLICABLE                     |              |                                                  |                                    |                                                       |                      |              | I        |
|                                                  |       | R STANDARD                       |              |                                                  |                                    |                                                       |                      |              | ı        |
| WS-                                              | -WE   | TTED SURFACE                     |              |                                                  |                                    |                                                       |                      |              | - 1      |
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| "LA                                              | ¥ I . | •                                |              | FCN NO                                           | DATA SI                            | IFFT NO                                               |                      |              | ⊣        |

IVΔ

GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

ORIG ISSUE: 5-15-84
REV NO.
REV DATE:

# B27.0 DISPLACER TYPE (ELECTRONIC) LEVEL CONTROLLER/TRANSMITTER (TVA-10581-27)

The first eleven lines should be filled out in accordance with the instructions in paragraph 1.1.

- Line 12 CASE LOCN--Mark "Left" or "Right."
- Line 13 UNIT WEIGHT--Mark "MS," or if knowledge of the weight is required, mark an "X" in the box to the left to indicate the bidder is to fill it in.
- Line 14 APPLICATION--Enter the desired application such as liquid level, specific gravity, control, indication, or transmission.
- Line 16 LIQUID--Enter the liquid to be measured.
- Line 17 OPR PRESS MAX-MIN--Enter the maximum and minimum cage operating pressure.
- Line 18 OPR TEMP MAX-MIN--Enter the maximum and minimum cage operating temperature.
- Line 19 SPGR AT OPR T-P--Enter the fluid specific gravity at the operating temperature and pressure.
- Line 20 AMBIFNT TEMP--Enter the ambient temperature limits of the area where the units will be mounted.
- Line 21 BODY MATL--Enter the rage body material.
- Line 22 ANSI RATING--Enter the ANSI pressure rating.
- Line 23 SYSTEM TEMP--Enter the operating temperature of the system fluid.
- Line 28 UPPER CONN--Enter the required type and size of the upper cage connection such as 2" RFF-150 psi, 2" SW, or 1-1/2" NPTF. Also, indicate its orientation: top, side right, side left, or side back.
- Line 29 LOWER CONN--Enter the required type and size of the lower cage connection such as 2" RFF-150 psi, 2" SW, or 1-1/2" NPTF. Also, indicate its orientation: bottom, side right, side left, or side back.
- 1. If a transmitter is specified, complete form TVA 10851-31 (see B31.0).

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Line 30 - ROTATABLE HEAD--Mark "yes" if required, "no" or "MS" if not.

Line 34 - GAUGE GLASS--Enter type such as "transparent" or "reflex," if required, "NA" if not.

Line 36 - SEPARATE JCT BOX--Mark "yes" if a separate junction box is required, "NA" if not.

Line 37 - SWITCHES - FORM--List the number of contacts required and form such as 2SPDT. If none, mark "NA" or "None."

Line 38 - SW ENCLOSURE - NEMA--List the switch NEMA rating required such as 3, 4, or 12.

Ein 39 - SW RATING--List the switch rating, such as 4 amperes at 120V ac. This may required both minimum and maximum contact ratings in older to satisfy both electrical and mechanical requirements.

Line 40 - MEAS INC - CONTACT--Designate whether contact "opens" or "closes" on measurement increase.

Line 51 - DISPLACER DIA--Enter the diameter of the displacer, or "MS."

Line 52 - DISPL LENGTH--Enter the displacer length, or "MS."

Line 53 - DISPL MATERIAL--Enter the displacer material, or "MS."

Line 54 - DISPL ROD LENGTH--Enter the length of displacer rod, or

Line 55 - DISPL ROD MATERIAL--Enter material of displacer rod, or "MS."

Line 57 - TORQUE TUBE MATL--Enter material of torque tube, or "MS."

Line 59 - COOLING EXTN--For applications at over 400 F mark whether or not air fin extension is required.

I.ne 62 - HYSTERESIS--Maximum incremental hysteresis difference between the upscale and downscale indications of the measured signal during a full range traverse for a given input, such as ±0.2 percent of span.

Line 65 - RESPONSE TIME--Enter the requirement, such as "2 seconds full scale."

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- Line 67 POWER CONSUMPTION--Enter the maximum allowable power consumption.
- Line 69 SPAN ADJ--Enter the minimum span adjustment if required, otherwise mark "MS."  $\,$
- Line 70 ZERO ADJ--Designate the minimum zero adjustment as required, otherwise mark "MS."
- Line 71 FUNCTION--Indicate how device is to be used by marking
  "TRANS" (transmitter) or "CNTLR" (controller), as applicable.
- Line 72 CONTROL ACTION. REVERSIBLE--Most controllers are reversible in the field. Delete if not required.
- Line 73 SUPPLY VOLTAGE--Enter the available supply voltage, such as 117V 60Hz 10.
- Line 74 MODES--Enter the operation modes such as "P" for proportional, "PI" for proportional plus integral, "PD" for proportional plus derivative, and "PID" for proportional plus integral plus derivative.
- Line 75 MEAS INC,- OUTPUT--Designate whether output should increase or decrease with measurement increase.
- Line 76 OUTPUT--Enter the required output, such as 10 t  $\flat$  50mAdc or 4 to 20mAdc.
- Line 77 PROP BAND ADJ (I)--Enter the proportional band adjustment desired, such as 2 to 200 percent.
- Line 78 RESET ADJ (I)--Enter the reset rate adjustment desired, such as 0.01 to 1 minute per repeat.
- Line 79 RATE ADJ (D)--Enter the derivative rate adjustment if required. However, derivative is seldom required on this type of liquid level measurement.
- Columns The columns can accomodate listing more than one instrument per page.

ITEM NO.--This is the contract item number and will be 'filled in by procurement personnel.

INSTRUMENT NO.--Enter the unique identification (UNID) number

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QTY--Enter the quantity of units with this number.

RANGE OR SPAN--Enter the desired operating range or span.

REMARKS--List accessories such as sight glass or cooling fins. Be sure to give complete details. If more room is needed, use footnotes.

MODEL BID and UNIT PRICE--These columns are to be filled in by the vendor when he submits his proposal.

REQUISITION NO. TVA 10581-27 (EN DES-2-84) 1 ITEM NO. 2 QUANTITY 3 INSTRUMENT NO 3 INSTRUMENT
4
5 SEISMIC CATEGORY
6 ASME CODE CLASS
7 MANUFACTURER
8 MODEL NO.
9 CASE STYLE MATL
10 ENCLOSURE
11 MOUNTING
12 CASE LOCN
13 UNIT WEIGHT
14 APPLICATION 48 49 € 50 <del>≥</del> 51 DISPLACER DIA DISPL LENGTH DISPL MATERIAL DISPL ROD LENGTH DISPL ROD MATL ( )RIGHT ( )LEFT PRIMARY E MATION

17 OPR PRESS MAX-MIN

18 OPR TEMP MAX-MIN

19 SPG AT OPR T-P

20 AMBIENT TEMP TORQUE TUBE MATL COOLING EXT 21 BODY MATL 22 ANSI RATING 23 SYSTEM TEMP 24 HYSTERESIS RESPONSE TIME 26 27 28 UPFER CONN 29 LOWER CONN 30 ROTATABLE HEAD POWER CONSUMPTION SPAN ADJ ZERO ADJ
FUNCTION
CONTROL ACTION
SUPPLY VOLTAGE
MODES
MEAS INC-OUTPUT TRANS ( ) CNTER 71 REVERSIBLE 72 72 E 73 X 74 X 75 -34 GAUGE GLASS 76 77 78 78 78 78 78 36 SEPARATE JCT BOX 37 SWITCHES-FORM 38 SW ENCLOSURE 39 SW RATING 40 MEAS INC-CONTACT M INSTRUMENT O OUTPUT PROP BAND ADC RESET ADJ (1) RATE ADJ (D) NEMA MODEL BID UNIT PRICE RANGE OR ITEM QTY REMARKS SPAN NO. NO. NOTES: (1) X---DATA BY BIDDER ---OR EQUAL NA--NOT APPLICABLE MS--MFR STANDARD WS--WETTED SURFACE DATE: M-6: SPECIFICATION NO. DISPLACER TYPE (ELECTRONIC) M-5: DATE: ENGR: DATE: LEVEL CONTROLLER/TRANSMITTER DATA SHEET NO. PLANT:

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# B28.0 SQUARE ROOT CONVERTER (TVA-10581-28)1

The first eleven lines should be filled out in accordance with the instructions in paragraph 1.1.

- Line 12 UNIT WEIGHT--Mark "MS," or if knowledge of the weight is required, mark an "X" in the box to the left to indicate the bidder is to fill it in.
- Line 15 CONDUIT CONN--Enter the conduit connection size, if applicable.
- Line 16 ELEC CONN--Enter the required electrical connection, such as plug and cable or screw terminals, or mark "MS."
- Line 17 SUPPLY VOLT/FREQ--Enter the supply voltage and frequency, such as 117V 60Hz.
- Lin- 18 TRANS PWR SUPPLY--Designate whether an integral power unit is required to power the transmitter.
- Line 19 TRANS PWR VOLTS--Enter the required Transmitter Power Supply Voltage or mark "NA".
- Line 20 AMBIENT TEMP--Enter the ambient temperature limits of the area where this equipment will be installed. If device is designated as class IE (line 4) refer to section B30.0 before completing this form.
- Line 21 INPUT SIGNAL--Enter the input signal, such as 4 to 20mAdc.
- Line 23 OUTPUT SIGNAL--Enter the required output signal, such as  $-4\ \text{to}\ 20\text{mAdc}\,.$
- Line 24 LOAD IMPEDANCE--Enter the range of impedance of the load in ohms.
- Line 25 POWER CONSUMPTION--Enter the maximum power consumption for the instrument in watts. (This would usually by determined by the bidder.)
- Line 30 VIBRATION--Specify the estimated acceleration and frequency of vibration, or enter "NA" if insignificant.
- 1. Completion of Form TVA 10851-31 also required (see B31.0).

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Line 41 - INPUT/OUTPUT ISOL--Mark "yes" if isolation between the input and output is required, mark "no" or "MS" if not.

Line 42 - LOW-LEVEL CUTOFF--Enter the value of the output signal at which cutoff is to occur, or mark "no" or "MS" if this feature is not desired.

Line 43 - OVERRANGE PROT--Enter the amount of overrange required without damaging the instrument. If not significant or none is required, write "MS."

Line 44 - POWER CORD--Designate length and describe any special plug requirements such as '18" twist lock.'

Line 46 - TEST JACKS--Mark "yes" or "MS."

Columns - The columns can accomodate listing more than one instrument per page.

ITEM NO.--This is the contract item number and will be filled in by procurement personnel.

INSTRUMENT NO.--Enter the unique identification (UNID) number.

QTY--Enter the quantity of units with this number.

REMARKS--List accessories. Be sure to give complete details. If more room is needed, use footnotes.

MODEL BID and UNIT PRICE--These columns are to be filled in by the vendor when he submits his proposal.

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|              |          | 111            | MOUNT                  | ING       |                  |                |                                                  |                | INPUT/OUTPUT                                     | 420F          |            | <u> 1</u> 27                                 |              | $\dashv$ |
|              | 1        | 12             | UNIT                   | WEI       | GHT              |                |                                                  |                | LOW-L-VEL CUT<br>OVERRANGE PRO                   |               |            | 21                                           | l            | Н        |
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| L            | 1        | 19             | TRANS                  | PW        | R VOLTS          |                |                                                  | LINA           |                                                  |               |            | 49<br>50                                     |              |          |
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#### B29.0 LIMIT SWITCHES (TVA-10581-29)

The first 11 lines should be filled out in accordance with the instructions in paragraph 1.1. Line 6 is left blank. Refer to figure B29-1 for a definition of terms.

Line 13 - TYPE--Check "ROTARY" or "PLUNGER", as applicable.

Line 14 - ACTION--Check "MAINTAINED" if maintained contact is required after the switch is actuated. Check "SPRING RET" if spring return is required.

Line 15 - OPRG TORQUE/PRESS--Enter the maximum operating torque (rotary type) or pressure (plunger type) that the operator can supply to operate the limit switch.

Line 16 - CONTACTING SURFACE--Enter the type of contacting surface required (roller, spring, rod, etc.).

#### NOTE

lines 18-21 should be filled in only if a plunger type limit switch is required. If a rotary type switch is being specified enter "NA" for lines 18-21.

- Line 18 ACT DIRECTION--Check "EXTEND" if switch actuation is required when switch plunger is extended. Check "COMPRESS" if switch actuation is required in the compressed position.
- Line 19 PLUNGER LG--Enter the required clearance between the mounting surface and plunger end when the switch is in its non-actuated position. If an adjustable clearance is required list the adjustable range.
- Line 20 PLUNGER TRAVEL--Enter the plunger travel required to actuate the switch.
- Line 21 PLUNGER OVERTRAVEL--Enter the amount of overtravel that the switch must sustain without damage after actuation.

#### NOTE

Lines 24-31 should be filled out only if a rotary type of limit switch is required. If a plunger type of switch is being specified enter "NA" in lines 24-31. IVA

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Line 24 - OPRG DIRECTION--Check the direction of rotation required for actuating the switch.

Line 25 - NON ACT POSN--Enter the required non-actuated location of the operating lever in degrees.

Line 26 - OPRG POSN--Enter the required location of the operating lever when the switch actuates in degrees.

Line 27 - OVERTRAVEL--Enter the amount of overtravel required after the switch actuates.

Line 29 - OPRG LEVER LG--Enter the operating level length required (see figure B29-1). If an adjustable length is required enter the adjustable range followed by "Adj."

Line 30 - SURFACE CLEAR--Enter the surface clearance (see figure B29-1).

Line 31 - OFFSET DEPTH--Enter the offset depth required (see figure B29-1).

Columns - The columns can accommodate listing more than one limit switch per page.

ITEM NO.--Will be filled out by procurement engineer.

INSTRUMENT NO. -- Enter UNID number of switch.

 $\ensuremath{\mathsf{QTY}}\text{--} Enter number of switches with the same instrument number.}$ 

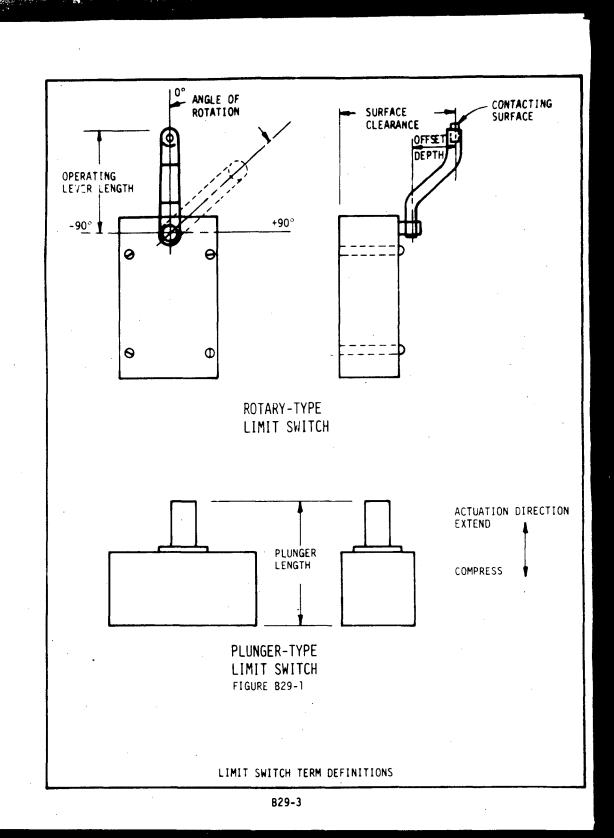
SWITCH - QTY--Enter the quantity of contact sets required.

SWITCH - TYPE--Enter the form of switch (SPDT, DPDT, etc.).

SWITCH - VOLTS--Enter the voltage rating for the switch.

SWITCH - AMPS--Enter the amperage rating for the switch.

REMARKS--Enter any additional requirements using footnotes if necessary.



REQUISITION NO. TVA 10581-29 (EN DES-2-84) 23 24 TITEN NO. OPRG DIRECTION ( )CW ( )CCH 2 QUANTITY 725 727 728 3 INSTRUMENT NO. 4 IEEE CLASS 5 SEISMIC CATEGORY DEG OPRG POSA DEG OVERTRAVEL OPRG LEVER LG SURFACE CLEAR OFFSET DEPTH **29** 30 31 MANUFACTURER MODEL NO.
9 CASE STYLE/MATE
10 ENCLOSURE
11 MOUNTING GENERAL ROTARY ( )PLUMGEN 35 )MAINTAIN ( )SPG RET 36 13 TYPE 14 ACTION 15 OPRG TORQUE/PRESS 16 CONTACTING SURF ( )EXTEND ( )COMPRESS 40 18 ACT DIRECTION PL UNGER Type 19 PLUNGER LG 20 PLUNGER TRAVEL 21 PLUNGER OVERTRAVEL 42 43 MITCH TTEM NO. INSTRUMENT REMARKS OTY VOLTS AMPS QTY TYPE NO. 26 24 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 NOTES: (1) X---DATA BY BIDDER \*---OR EQUAL NA--NI)T APPLICABLE MS--MER STANDARD DATE: DSGNR: SPECIFICATION NO. DATE: CHKR: LIMIT SWITCHES DATA SHEET NO. PR NO. PLANT: ECN NO

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B30.0 ENVIRONMENTAL CONDITIONS FOR CLASS 1E EQUIPMENT (TVA 10581-30 and TVA-10581-30a)

It is mandatory that forms TVA-10581-30 and TVA-10581-30a be completed for each device designated as IEEE Class 1E on line 4 of TVA forms 10581-1 through 10581-29.

Data forms TVA 10581-30 and 10581-30a should carry the same data sheet number (lower right corner) as the data form that identifies the requirements for the device. TVA 10581-30 or 10581-30a then becomes "Sheet 2" of that data sheet.

Any data sheet entries on the device data forms (TVA 10581-1 through 10581-29) for environmental conditions (ambient temp., press, etc.) should refer the the related from TVA 10581-30, sheet 2, by entering "see sheet 2" in the proper blank on sheet 1.

The lines of form TVA 10581-30 should be completed as follows:

- Line 1 ITEM NO.--Will be completed by the procurement engineer.
- Line 2 INSTRUMENT NO.--Enter the instrument (UNID) number.
- Line 6 NORMAL TEMPERATURE--Enter the normal ambient temperature the device must operate in (include units).
- Line 7 NORMAL PRESSURE--Enter the normal ambient pressure the device must operate in (include units).
- Line 8 NORMAL HUMIDITY--Enter the normal ambient relative humidity the device must operate in (in % RH).
- Line 9 NORMAL RADIATION--Enter the normal (background) radiation (in RADS-TID).
- Line 10 NORMAL DUST--Check "yes" if device must normally operate in an extreme dust environment; check "no" otherwise.

#### NOTE

Abnormal operating conditions are defined as conditions that may exist for a small percentage of the plant's lifetime. The abnormal operating conditions do not include accident conditions. An example of an abnormal operating condition might be the abnormal temperature and humidity caused by the failure of an air conditioning unit on a hot summer day, or the abnormal ambient pressure caused containment leak rate test pressurization. These definitions of "abnormal" should be considered when completing lines 14-18.

B30-1

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Line 14 - ABNORMAL - TEMPERATURE--Enter the abnormal ambient operating condition (include units).

Line 15 - ABNORMAL - PRESSURE--Enter the abnormal ambier operating pressure (include units).

Line 16 - ABNORMAL - HUMIDITY--Enter the abnormal ambient operating humidity (in % RH).

Line 17 - ABNORMAL - RADIATION--Enter the abnormal background radiation (in RADS).

Line 18 - ABNORMAL - OPERATE SUBMERGED--Mark "yes" if device must operate submerged, "no" otherwise.

fine 19 - ABNORMAL - NONOPERATE SUBMERCED--Mark "yes" if device must operate after being submerged but not while submerged.

Line 20 - ABNORMAL - DEPTH--Enter the depth of submergence if "yes" was marked in lines 18 or 19 above: "NA" otherwise.

#### NOTE

The accident operating conditions are those ambient conditions that exist because of an accident (LOCA or HELB) (1) through which a device must satisfactorily operate to migitate the accident, or (2) through which it must not fail in a manner detrimental to plant safety. When the accident operating conditions are available in graph form, or as an algebraic function of time, include the graph or function on the form TVA-10581-30a or 30b (or on a separate attachment). When the information is included in graph or function form, refer to the graph or function in the appropriate blank on the form TVA 10581-30.

- Line 21 ACCIDENT TEMPERATURE--Enter the peak ambient accident temperature through which the device must operate.
- Line 22 ACCIDENT PRESSURE--Enter the peak ambient accident pressure through which the device must operate.
- Line 23 ACCIDENT HUMIDITY--Enter the peak ambient accident humidity through which the device must operate.
- Line 24 ACCIDENT RADIATION DOSE--Enter the amount of radiation (in RADS-TID) the device will receive as a result of the accident only.

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Line 25 - ACCIDENT - MAX RAD DOSE RATE/TIME--Enter the maximum radiation dose rate and the length of time this dose rate will continue.

Line 26 - ACCIDENT - CAUSTIC SPRAY--If the device will experience caustic spray-down during an accident and is required to operate during or after the spray-down, check "yes." If "yes" is checked, the section of the form TVA-10581-30 entitled "Caustic Spray Composition" should be completed. If device will not experience caustic spray-down or is not required to operate during or after a caustic spray-down, check "no."

Line 27 - ACCIDENT OPROTIME(1)--Enter the length of time after the beginning of the accident that the device must operate (in minutes, hours, days).

i.ine 28 - ACCIDENT - SUBMERGENCE DEPTH--If the device must continue to operate or not fail in a manner detrimental to plant safety when submerged, enter the submergence depth (in feet or inches), otherwise mark "NA."

Line 29 - ACCIDENT - REQ'D ACCURACY--Enter the required accuracy of the device during and after the accident:

Other entries - ITEM NO.--Same as line 1.

INSTRUMENT NO.--Same as line 2.

FUNCTION--Describe briefly but clearly, in detail the function of the device. (Example: "The pressure switch must actuate during all LOCAs and HELBs inside the containment to initiate the start of reactor coolant injection pump if the pressure of the reactor coolant injection header drops below 2000 psia.") If the device is part of an instrumentation loop, enter "refer to loop data sheet XX for definition of function."

REMARKS--List any other pertinent information.

CAUSTIC SPRAY COMPOSITION--If the "yes" blank for "caustic spray" (line 26) has been checked, enter the caustic spray chemical composition. Be sure to include units (e.g., % by volume, % by weight, % Molar). Also include the pH.

| TV                                                                         | A 10581-30 (EN | DES 2-84)               |             |          | REQUISI  | TION  | NO          | <b>—</b> —  |             | -        |
|----------------------------------------------------------------------------|----------------|-------------------------|-------------|----------|----------|-------|-------------|-------------|-------------|----------|
|                                                                            | ITEM NO.       |                         |             |          |          |       |             |             |             |          |
| 2                                                                          | INSTRUMENT NO  | <u> </u>                |             |          |          |       |             |             |             |          |
| 3                                                                          |                |                         |             |          |          |       |             |             |             | $\dashv$ |
| 4                                                                          |                |                         |             |          |          |       |             | <del></del> |             | $\neg$   |
| - 51                                                                       |                | TOPONENTALINA           | <del></del> |          |          |       |             |             |             | $\neg$   |
| 읫                                                                          | NORMAL         | TEMPERATURE             | <del></del> |          |          |       |             |             |             |          |
| 닊                                                                          |                | PRESSURE<br>HUMIDITY    | +           |          |          |       |             |             |             |          |
| 읭                                                                          |                | RADIATION               | <del></del> |          |          |       |             |             |             |          |
| 10                                                                         |                | DUST                    | ( )YES      | ( )NO    | ( )YES   | ( )NO | ( )YES      | )NOL(       | ) YES (     | 1110     |
| 17                                                                         |                | 0031                    | 1           |          |          |       |             |             |             |          |
| 12                                                                         |                |                         |             |          |          |       |             |             |             | -        |
| 13                                                                         |                |                         |             |          |          |       |             |             |             |          |
| 5<br>6<br>7<br>8<br>9<br>10<br>11<br>12<br>13<br>14                        | ABNORMAL       | TEMPERATURE             |             |          |          |       |             |             |             |          |
| 15                                                                         |                | PRESSURE                |             |          |          |       |             |             | <u> </u>    |          |
| 16                                                                         |                | HUMIDITY                |             |          |          |       |             |             |             |          |
| 12                                                                         |                | RADIATION               | 1 1055      | / \\     | / \vec   | / 110 | / IVEC      | ( )NO (     | )YES (      | )NO      |
| 18                                                                         |                | OPERATE SUBMERGED       | ( )YES      | ( )NO    | ( )YES   |       |             | ) NOI (     |             | )NO      |
| 19                                                                         |                | NON-OPERATE SUB         | ( )YES      | jnu      | 1163     | 1 110 | 1 /153      | 7,10        | 7,63        | 7,10     |
| 16<br>17<br>18<br>19<br>20<br>21<br>22<br>23<br>24<br>25<br>26<br>27<br>28 |                | DEPTH                   | <del></del> |          |          |       | <del></del> |             |             |          |
| 121                                                                        | ACCIDENT       | TEMPERATURE<br>PRESSURE |             |          |          |       |             |             |             |          |
| 155                                                                        |                | HUMIDITY                | +           |          |          |       |             |             |             |          |
| 24                                                                         | ł              | RADIATION DOSE          |             |          | l        |       |             |             |             |          |
| 25                                                                         | 1              | MAX RAD DOSE RATE/TI    | ME          |          |          |       |             |             |             |          |
| 26                                                                         |                | CAUSTIC SPRAY           | ( )YES      | ON(      | ( )YES   | ( )NO | ( )YES      | ( )NO       | YES (       | )NO      |
| 27                                                                         | 1              | OPRG TIME (1)           |             |          |          |       | <u> </u>    |             |             |          |
| 28                                                                         | ]              | SUBMERGENCE DEPTH       |             |          | ļ        |       | ļ           |             |             |          |
| 29                                                                         |                | REQ'D ACCURACY          |             |          | ļ        |       | ļ           |             |             |          |
| 30                                                                         |                |                         |             |          | <u> </u> |       | <u> </u>    |             | <del></del> |          |
| 17                                                                         | 'EM NO.:       |                         | THZIK       | UMENT NO | • •      |       |             |             |             |          |
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| 1 +1                                                                       | INCTION:       |                         |             |          |          |       |             |             |             |          |
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| C.F                                                                        | AUSTIC SPRAY C | OMPOSITION:             | NOTES:      |          |          |       | IS TIME     |             | RTHE        |          |
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| 100                                                                        | ANT:           | T                       | R NO.       |          |          |       | CLASS 1     |             |             |          |
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| TVA 10581-30a (EN DES 2- | -84)              | REQUISITION NO.                                                          |
|--------------------------|-------------------|--------------------------------------------------------------------------|
| ITEM NO.                 | INSTRUMENT NO.:   |                                                                          |
| FUNCTION:                | _                 |                                                                          |
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| REMARKS:                 |                   |                                                                          |
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| FUNCTION:                |                   |                                                                          |
| REMARKS:                 |                   |                                                                          |
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| ITEM NO.:                | INSTRUMENT NO.:   |                                                                          |
| FUNCTION.                |                   |                                                                          |
| TONCTION.                |                   |                                                                          |
| REMARKS:                 |                   |                                                                          |
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| DSGNR: DATE:             |                   | CARDANDA AND AND AND AND AND AND AND AND AN                              |
| CHKR: DATE:              |                   | SPECIFICATION NO. ENVIRONMENTAL CONDITIONS                               |
|                          | PR NO.<br>ECN NO. | ENVIRONMENTAL CONDITIONS FOR CLASS 1E EQUIP CON'T DATA SHEET NO. SHEET R |
|                          | ILUN NO.          | TONIN SHEET NO. SHEET N                                                  |

GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

ORIG ISSUE: 5-15-84

REV NO. REV DATE:

### B31.0 LOOP DATA (TVA 10581-31)

When an instrument forms part of an instrument loop, form TVA 01581-31 and form TVA 10581-XX must be completed for each instrument to ensure compatability with other instruments in the loop. Form TVA 10581-31 shall be completed as follows:

LOOP SKETCH--Draw a simple, functional sketch (bubble diagram) showing all instruments in the loop. Include existing instruments and new instruments. Indicate the physical location of each instrument by entering "FM" for field mounted, "AIR" auxiliary instrument room, or "MCR" main control room, beside the instrument symbol on the sketch.

PROCESS RANGE--Enter the process range in engineering units.

SIGNAL--If the same signal is used throughout the loop, enter the signal range. If multiple signals and mediums are included in the same loop enter "see below."

FUNCTION NO. -- No entry required.

FUNCTION--Enter the type of function to be performed by the loop (alarm, trip, indicate, control, etc.). Where loop has multiple functions, list each function separately in rows and complete an entry for each column of the row. For a trip function, the next row entry shill be for the reset function and shall be identified as "reset X," where X is the function number for the trip function.

FINAL DEVICE--Enter the instrument number of the last instrument in the loop that performs the function. (For example, electronic switch TS-74-54 provides trip function).

ACCURACY BASIS--Enter the basis for calculating the accuracy specified in the "ACCURACY" column (% span, % reading, engineering units, etc.).

ACCURACY RANGE--Specify the range in engineering units over which the accuracy specification applies. If the accuracy is required throughout the entire range enter "ENTIRE."

IVA

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LOOP INSTRUMENTS--This section is needed only if part of the instrument loop is being specified for procurement. This helps ensure that all instruments in the loop will be compatible with the instruments being procured. This section is not required when the entire loop is being specified for procurement.

INST NO.~-List the UNID number for each instrument shown on the LOOP SKETCH.

MANUFACTURER--Enter the manufacturer for each instrument number.

MODEL NO, -- Enter the model number.

INPUT SIGNAL--Enter the required input signal for each instrument as installed in the loop. For electronic current loops include the current to the dropping resistor (if separate from the instrument) in the input signal specification. Include units in the "input signal" entry (mA, V, psi, etc.). If the instrument is a loop sensor enter "PROCESS." (In "flow-sensing" loops using differential pressure primary flow sensors (orifice plates, pitot tubes, annuhars, etc.) the primary flow sensor is considered as the loop sensor.)

INPUT IMPEDANCE--For electronic loops, enter the input impedance for each instruments, including any loop dropping resistors. Include tolerance values for dropping resistors, where applicable. For non-electronic loops, enter "NA."

OUTPUT SIGNAL--Enter the output signal for each instrument including units (mA, V. psi, etc.). For contact outputs enter "CONTACT."

ACCURACY--Enter the accuracy of the instrument as specified by the manufacturer. This figure must include the effects of environmental extremes or other factors and must correspond to the operating conditions assumed when the function accuracy was specified.

ACCURACY BASIS--Enter the basis for the accuracy (e.g., % input span, % output span, % reading).

POWER SUPPLIES--Complete this section only if an existing power supply will be used or if the power supply is being procured under a separate PR.

INST NO. --Enter the instrument number of the power supply.

MANUFACTURER--Enter the name of the manufacturer.

IVA

GROUP: INSTRUMENTATION AND CONTROLS

TITLE: Preparation of Data Sheets for Purchase Requests

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MODEL NO. -- Enter the complete model number.

RATING--VOLTAGE--Enter the nominal power supply voltage.

RATING--CURRENT--Enter the maximum current at the rated voltage.

VOLTAGE REGULATION--Enter the voltage regulation as either a range of voltage or a percent of nominal voltage. For unregulated power supplies, a voltage range shall be specified that includes the effects of anticipated ac bus voltage flucuations.

REQUISITION NO. IVA 10581-31 (EN DES 2-84) SKETCH 1.00P NOTE: FM=FIELD MOUNTED, AIR=AUXILIARY INSTRUMENT ROOM, MCR=MAIN CONTROL ROOM SIGNAL ACCURACY ACCURACY BASIS RANGE FINAL **FUNCTION FUNCTION ACCURAC** r DEVICE LOOP INSTRUMENTS (THIS SECTION WILL BE COMPLETED ONLY IF A PART OF THE INSTRUMENT LOOP IS EITHER EXISTING OR PROCURED UNDER A SEPARATE PROCESS) INST NO. OUTPUT SIGNAL MODEL INPUT INPUT MANY - ACTURER NO. SIGNAL IMPED RACY POWER SUPPLIES (THIS SUPPLY WILL BE USED) SECTION WILL BE COMPLETED ONLY 17 AN EXISTING POWER RATING VOLTAGE REGULATION INST MANUFACTURER MODEL VOLTAGE CURRENT NO. NOTES: (1) \*---OR EQUAL NA--NOT APPLICABLE MS--MER STANDARD EX--EXISTING EQUIPMENT N---NEW DSGNR: DATE: SPECIFICATION NO. DATE: CHKR: PLANT: PR NO. DATA SHEET NO. ECN NO

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EVALUATION SHEET

Rev. R3 Date  $\frac{3}{13/84}$ 

1. Task Force Category 6 for Watts Bar Nuclear Plant - Unit 1

2. Task Force Category Description and Related B&V Findings: Discrepancies between design documents (analysis results, load tables, isometric drawings, design drawings, etc.) used in the design of piping systems: F310, F319, F324, F325, F346, F751, F868.

### 3. Evaluation for Cause

# A. Preliminary

(1) Regarding findings (F319, F324, F325, F346) the cause stems from ineffective handling of interfaces between two analysis (i.e., lap zones). (2) The remaining findings appear from the initial evaluation to be random errors in the design verification process with no uniquely definable cause.

### B. Final

WBN unit 1: Regarding findings F319, F324, F325, and F346 the cause stems from: (la) ineffective handling of the interface region between two analyses and (lb) errors related to the use of the -ANCHOR program. (2) The remaining findings were determined to be random individual errors in the design process with no uniquely identifiable cause. The errors if uncorrected would not result in a failure of the piping pressure boundary or loss of system function. No additional evaluation is required.

Resp. Org. 72 comme 3/15/84 Task Force Concurrence 2/16/84

# 4. Evaluation for Generic Examples

### A. Preliminary

(1) The scope of the evaluation for generic examples should include a review of all lap zones in Watts Bar unit 1. (2) The determination of generic examples will be made after the cause and effects of the individual findings are evaluated.

#### B. Final

(la, lb) The scope of the evaluation for generic examples should include a review of all rigorous analyzed lap zones and anchors (effected by the -ANCHOR program) in WBN unit 1. (2) No further evaluation is required, see 3.B.(2) above.

(la, lb) The review has been completed. Thirty-two problems were identified requiring revision due to lapping deficiencies. All skewed anchors which were analyzed using the direction cosine option in question will be reanalyzed.

Resp. Org. 72 Grim 3/15784 Task Force Concurrence 28/11/84

- 5. Licensing Basis Satisfaction
  - A. Preliminary
    - (1) The licensing bases for these findings are not satisfied. (2) The determination of whether or not the licensing basis for the remaining findings are satisfied will be made after the findings are evaluated.
  - B. Final (la, lb) The licensing basis for these rindings is not satisfied. (2) Licensing basis is satisfied.

Resp. Org. 72 Cuin 3/15784 Task Force Concurrence 2 June 3 1/6/84

- 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work
  - A. Preliminary (1) USNRC NUREG/CR-1980 addresses lapping in piping analyses. Also corrective action is in progress in response to unresolved Item 390/82-27-09 per NR letter D.M. Verrelli to H. G. Parris dated September 10, 1982 and NCR's WBNCEB 8233 WBNSWP 8309, WBNSWP 8312, WBNCEB 8232. This appears to be an adequate approach but the task force has not fully evaluated the corrective actions. (2) No generic corrective action is identified for this group of findings.
  - B. Final

    (1a) NCRs WBNCEB8233, WBNSWP8309, WBNSWP8312, and WBNCEB8232 specifically address the findings and cause. All lapped regions are being reviewed and corrections are being made to piping analysis and support design as required. Unresolved item 390/82-27-09 is being investigated and the correctness of the WBN lapping technique is being verified. Criteria has been issued in the rigorous analysis handbook. This correction is judged adequate. (See Continuation Sneet page 7.)

    Resp. Org. Technical 3/5/84. Task Force Concurrence
- 7A. Identification of Corrective Action for Completed Work
  - A. Preliminary
    (1) Resolve differences in lap zones analyses and results and any designs resulting therefrom. (2) All findings not identified in 3.A.l shall be evaluated to determin whether or not the affected piping systems will fail (loss of function) if the conditions found by B&V were not corrected. This information will be used to determine if identification of other generic examples are required.
  - B. Final

The plan in 6A.B. appears adequate.

Resp. Org. 72 Commin 3/15/84 Task Force Concurrence 3/16/84

- 8A. Implementation and Inspection of Corrective Action for Completed Work
  - A. Preliminary
  - B. Final

(1a) All piping analysis work is complete. A total of 32 problems were revised (12 of these were reanalyzed). The WBN lapping criteria has been verified by EDS (IMPELL) as being correct. Remaining design work is being tracked through NCRs WBNCEB8233, WBNSWP8309, WBNSWP8312 and WBNCEB8232. (1b) All piping analysis work is complete. All affected anchor load tables have been reissued. Remaining design work is being tracked through NCR GENCEB8302(R1). (2) Deviation corrected if appropriate.

Resp. Org. 72 June 3/15/84 Task Force Concurrence 2/16/84

- 9A. Identification and Evaluation of Ongoing Corrective Action for Future Work
  - A. Preliminary (1) USNRC NUREG/CR-1980 addresses lapping in piping analyses. Also corrective action is in progress in response to unresolved Item 390/82-27-09 per NRC letter D.M. Verrelli to H. G. Parris dated September 10, 1982 and NCR's WBNCEB 8233, WBNSWP 8309, WBNSWP 8312, WBNCEB 8232. This appears to be an adequate approach but the task force has not fully evaluated the corrective actions. (2) No corrective action has been identified for this group of findings.
  - B. Final

(1a) As discussed in 6A.B the lapping criteria has been issued in the rigorous analysis handbook. (1b) As discussed in 6A.B the -ANCHOR program has been modified, the output has been modified, and the owners manual has been modified.

(2) No further corrective action is required.

Resp. Org. T. Commis 3/15/84 Task Force Concurrence 21/184

10A. Identification of Corrective Action for Future Work

A. Preliminary

B. Final

The action identified in 9A.B appears to be adequate.

Resp. Org. 72 Junia 3/15784 Task Force Concurrence Affer 3 1/k/84

| 6B. | Resp. Of                  | som Weisennber 27, 198  8. Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Market Mar | Evaluation of                   | Task Fo                             | orce Concurre                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ence Marie Comp                | Files dated             |
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| 6B. | Resp. Of Identifi A. Prel | won Weisennber 27, 198                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1stein's memo: 34 (QMS 84112)   | randum to Q<br>7 200).<br>— Task Fo | orce Concurre                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ence                           | Files dated             |
| 6B. | Resp. Of Identifi A. Prel | won Weisennber 27, 198                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1stein's memo: 34 (QMS 84112)   | randum to Q<br>7 200).<br>— Task Fo | orce Concurre                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ence                           | Files dated             |
| ъв. | Resp. Of Identifi         | won Weisen aber 27, 198                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1stein's memo: 34 (QMS 84112)   | randum to Q<br>7 200).<br>— Task Fo | orce Concurre                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ence                           | Files dated             |
| В.  | Resp. Of Identifi         | won Weisen aber 27, 198                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1stein's memo: 34 (QMS 84112)   | randum to Q<br>7 200).<br>— Task Fo | orce Concurre                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ence                           | Files dated             |
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|     | J. W.<br>Novem            | von Weisen                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | istein's memo:                  | randum to Q                         | ory evaluation of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of | on sheet is n<br>ement Staff F | noted in<br>Files dated |
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|     | A. Prel                   | ıminary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                 |                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                |                         |
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|     |                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                 |                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                |                         |
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|     |                           | r to 9A.B.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                 | ·                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ٠.                             |                         |
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11A. Implementation of Corrective Action for Future Work

| , b. idemetrication or                   | Corrective Acti        | on for Completed Work                                    |      |
|------------------------------------------|------------------------|----------------------------------------------------------|------|
| A. Preliminary                           |                        |                                                          |      |
| N/A                                      |                        |                                                          |      |
|                                          |                        |                                                          |      |
|                                          |                        |                                                          |      |
| B. Final                                 |                        |                                                          |      |
|                                          |                        |                                                          | •    |
|                                          |                        |                                                          |      |
|                                          |                        |                                                          |      |
| Resp. Org.                               |                        | _ Task Force Concurrence                                 |      |
|                                          |                        |                                                          |      |
| -                                        | Inspection of (        | Corrective Action for Completed                          | Work |
| A. Preliminary                           |                        |                                                          |      |
| N/A                                      |                        |                                                          |      |
|                                          |                        |                                                          |      |
|                                          |                        |                                                          |      |
| B. Final                                 |                        |                                                          |      |
|                                          |                        |                                                          |      |
|                                          |                        | •                                                        |      |
|                                          |                        |                                                          |      |
|                                          |                        |                                                          |      |
| Resp. Org.                               | //                     | Task Force Concurrence                                   | /_/  |
|                                          | / /                    |                                                          |      |
| B. Identification and                    | / /<br>Evaluation of O | Task Force Concurrence Ongoing Corrective Action for Fut |      |
|                                          | / /<br>Evaluation of O |                                                          |      |
| B. Identification and                    | / / Evaluation of O    |                                                          |      |
| B. Identification and A. Preliminary     | / / Evaluation of O    |                                                          |      |
| B. Identification and A. Preliminary N/A | / / Evaluation of O    |                                                          |      |
| B. Identification and A. Preliminary     | / / Evaluation of O    |                                                          |      |
| B. Identification and A. Preliminary N/A | / /<br>Evaluation of O |                                                          |      |
| B. Identification and A. Preliminary N/A | / /<br>Evaluation of O |                                                          |      |
| B. Identification and A. Preliminary N/A | / / Evaluation of O    |                                                          |      |

| A. Preliminary          |                  |                          |           |     |
|-------------------------|------------------|--------------------------|-----------|-----|
| N/A                     |                  |                          | •         |     |
|                         |                  |                          |           |     |
|                         |                  |                          | •         |     |
| B. Final                |                  |                          |           | •   |
|                         |                  |                          |           |     |
| •                       |                  |                          |           |     |
| Resp. Org.              | 1 1              | Task Force Concurrence   |           | / / |
| B. Implementation of Co | orrective Action | n for Future Work        |           |     |
| A. Preliminary          | •                |                          |           |     |
| N/A                     |                  |                          | •         |     |
|                         |                  |                          |           |     |
|                         |                  |                          |           |     |
| B. Final                |                  |                          |           |     |
|                         |                  |                          |           |     |
|                         |                  |                          |           |     |
|                         |                  |                          |           |     |
| Resp. Org.              | /_/              | Task Force Concurrence   |           | / / |
|                         |                  |                          |           |     |
| 3. Verification of Effe | ectiveness of Co | orrective Action for Fut | ture Work |     |
| 3. Verification of Effe | ectiveness of Co | orrective Action for Fut | ture Work |     |
| A. Preliminary          | ectiveness of Co | orrective Action for Fut | ture Work |     |
|                         | ectiveness of Ca | orrective Action for Fut | ure Work  |     |
| A. Preliminary<br>N/A   | ectiveness of Ca | orrective Action for Fut | ure Work  |     |
| A. Preliminary          | ectiveness of Ca | orrective Action for Fut | ure Work  |     |
| A. Preliminary<br>N/A   | ectiveness of Co | orrective Action for Fut | ure Work  |     |
| A. Preliminary<br>N/A   | ectiveness of Ca | orrective Action for Fut | ure Work  |     |
| A. Preliminary<br>N/A   | ectiveness of Ca | orrective Action for Fut | ure Work  |     |

10B. Identification of Corrective Action for Future Work

TVA Task Force for Review of Black & Veatch Findings

### BLACK & VEATCH EVALUATION SHEET (Continuation Sheet)

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

### B. Final - continued

(1b) NCR GENCEB8302 R1 specifically addresses this cause. The -ANCHOR program has been modified, the output has been modified, and the users manual has been modified to reflect these changes. All skewed anchors which were analyzed using the direction cosine option in question will be reanalyzed. Anchor loads will be compared to the previous design loads, and anchors will be redesigned as needed. This correction is judged adequate. (2) These were random individual errors and no further corrective action is required.

UNITED STATES GOVERNMENT

### Memorandum

: Quality Management Staff Files

. J. W. von Weisenstein, 384 SPB-K FROM

DATE : NOV 27 1984

SUBJECT: ASSESSMENT OF ADEQUACY OF CORRECTIVE ACTION FOR FUTURE WORK FOR BLACK AND

VEATCH TASK FORCE CATEGORY 6

For this category, the TVA task force for review of Black and Veatch findings determined that the condition was applicable to Watts Bar units 1 and 2 and that corrective action was required for completed and future work. QMS performed a surveillance in accordance with the attached scoping document to assess the adequacy of corrective action implementation for completed and future work, as well as the effectiveness of corrective action for future work. The results of that surveillance, contained in the attached surveillance report, verified the adequacy of the work accomplished.

Additionally, our surveillance was primarily of unit 1 corrective actions as unit 2 corrective actions are scheduled for completion by February 1986. Based on our assessment of the adequacy of corrective actions for unit 1 and that unit 2 corrective actions are in a controlled system (NCR GENCEB8403), we have adequate confidence that unit 2 corrective actions will be properly tracked to completion.

As a result of the aforementioned controls and our assessment of category 6, we conclude that this category can be closed by signing and dating item 12A, "Verification of Effectiveness of Corrective Action for Future Work."

von Weisenstein

TENNESSEE VALLEY AUTHORITY

84112900345

'841127 200

OMS

JVW: MBP

Attachments

cc: E. G. Beasley, W12C61 C-K (Attachments)

J. S. Colley, 374 SPB-K (Attachments) H. L. Jones, W10D224 C-K

Principally Prepared By: J. W. von Weisenstein (7706)

11/27/84 - EGB:MBP

cc (Attachments):

R. W. Cantrell, WllA9 C-K

MEDS, W5B63 C-K



QUALITY MANAGEMENT STAFF
SURVEILLANCE REPORT FOR THE ASSESSMENT
OF THE EFFECTIVENESS OF CORRECTIVE ACTIONS
IDENTIFIED IN THE TASK FORCE REPORT ON THE
BLACK AND VRATCH FINDINGS

PLANT: Watts Bar

CATEGORY: 6

Prepared By: Ally | Adda. Approved By: Associated by: Associated by: Approved By: Associated by: Associated by: Associated by: Associated by: Associated by: Approved By: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by: Associated by:

### I. Management Summary:

The design processes evaluated are outlined in the attached surveillance scoping document and were determined to be in compliance with requirements.

### II. Conclusions and Recommendations:

Based upon the results of this surveillance, implementation of corrective action for completed work and future work have been accomplished as committed by the TVA task force evaluation sheets for category 6. It should be noted, however, that although corrective action for Watts Bar unit 1 is complete, corrective action for unit 2 has not been completed. Corrective action for unit 2 is being handled per NCR GENCEB8403 (ECN 3883) and is scheduled for completion by February 1986.

The basic corrective action for both units was to revise the -ANCHOR computer program and then revise the affected documents (drawings, etc.). The -ANCHOR computer program has been revised and all that remains is the revision to the affected documents for unit 2. This activity is being handled in a controlled system (NCR and ECN) and should be acceptable for closure of this category.

#### III. Details:

A. Performed the following surveillance activities to verify implementation of corrective action for completed work:

Verify that a review was performed and documented for all rigorously analyzed lap zones and anchors (effected by the -ANCHOR program in WBN unit 1). Sample one problem to verify that any deficiencies were identified and corrected (or are in a controlled system and are to be corrected). Verify that the review identified all skewed anchors analyzed with the direction cosine option. Sample one such analysis to verify reanalysis was performed to correct the deficiencies (or that the deficiencies are in a controlled system and are to be corrected).

Page 1 of 4

02530

Results: All of the Black and Veatch findings classified as category 6 were associated with the WBN anchor program in some manner. There were several individual NCRs written to cover these detailed findings and an overall generic NCR to cover the computer program used for the anchor program. As a part of the corrective action for the overall generic NCR, all anchor problems have been rerun or are planned to be rerun. By virtue of rerunning all the anchor problems, each individual Black and Veatch finding is being resolved. The following is a listing of the NCRs which cover the detailed findings.

1. NCR WBNCEB8232

- a. Affected documents: N3-9-4A, 0600200-02-05, and 47B427-370
- b. ECN 3511
- c. NCR closure memorandum CEB 840402 004

2. NCR WBNCEB8233

- a. Affected documents: N3-3-13A and N3-3-14A
- b. ECN 3511
- c. NCR closure memorandum CEB 840413 002

3. NCR WBNSWP8309

- a. Affected documents: 47A060-3-8 and 47A060-3-10
- b. ECN 3511
- c. NCR closure memorandum MEB 840412 009

4. NCR WBNSWP8312

- a. Affected documents: 47A060-3-9 and 47A060-3-11
- b. NCR closure memorandum MEB 840503 022

These NCRs and their associated documents were reviewed and found to be acceptable for the closure of the detailed findings for WBN unit 1.

The starting point for the anchor program is the computer program which is used for determining the design loads for piping anchors. This program was found to be in error and was documented on NCR GENCEB8302. This NCR was later superseded by NCR GENCEB8402. The basic corrective action for this NCR was to revise the computer program, rerun the anchor loads, and revise the affected documents. This action has been completed for unit 1 and NCR GENCEB8402 has been closed per memorandum CEB 840525 003. However, the remaining activity for unit 2 has not been completed and is being tracked per NCR GENCEB8403. The scheduled date for completion is February 1986.

B. Performed the following surveillance activities to verify implementation of corrective action for future work:

Verify that the -ANCHOR program and the owner's manual have been modified so that all deficiencies were corrected.

Page 2 of 4

Results: Revision 3 of the -ANCHOR computer program was issued March 8, 1984, along with the user manual. This revision corrected the identified deficiencies.

C. Performed the following surveillance activities to assess the effectiveness of corrective action for future work:

Assess the effectiveness of the corrective action for one anchor analysis problem which was analyzed after completion of the corrective action.

Results: Reviewed the following anchor analysis problem and associated documents and found it to be acceptable: 060D250-09-10 and 47B435-574.

### IV. <u>Documents Reviewed</u>:

### Design Calculations

- 1. N3-3-4A
- N3-3-13A
- 3. N3-3-14A
- 0600200-02-05
- 060D250-09-10

### Design Drawings

- 1. 47A060-3-8
- 2. 47A060-3-9
- 3. 47A060-3-10
- 4. 47A060-3-11
- 5. 47B427-470 6. 47B435-574

### Nonconformance Reports

- 1. NCR GENCEB8302
- 2. NCR GENCEB8402
- 3. NCR GENCEB8403
- NCR WBMCEB8232
- NCR WBNCEB8233 NCR WBMSWP8309
- NCR WBMSWP8312

### Engineering Change Motice

ECN 3511

Page 3 of 4

V. List of Personnel Contacted:

Title

Organization

R. W. Griffith D. C. Phung

Mechanical Engineer Civil Engineer

OE-MEB-WBEP OE-CEB

VI. Scoping Document (Attached)

QUALITY HANAGEMENT STAFF
SCOPING DOCUMENT FOR THE ASSESSMENT
OF THE EFFECTIVENESS OF CORRECTIVE ACTIONS
IDENTIFIED IN THE TASK FORCE REPORT ON THE
BLACK AND VEATCH FINDINGS

PLANT: Watts Bar CATEGORY: 6

Prepared By: L.E. Brock vec Date: 2/20/24 Approved By:

Date: 4.20.

I. Verification of Corrective Action Implementation for Completed Work

Perform the following surveillance activity:

Verify that a review was performed and documented for all rigorously analyzed lap zones and anchors (effected by the -ANCHOR program in WBN unit 1). Sample one problem to verify that any deficiencies were identified and corrected (or are in a controlled system and are to be corrected). Verify that the review identified all skewed anchors analyzed with the direction cosine option. Sample one such analysis to verify reanalysis was performed to correct the deficiencies (or that the deficiencies are in a controlled system and are to be corrected).

II. Verification of Corrective Action Implementation for Future Work

Perform the following surveillance activity:

Verify that the -ANCHOR program and the owner's manual have been modified so that all deficiencies were corrected.

III. Assessment of Effectiveness of Corrective Action for Future Work

Perform the following surveillance activity:

Assess the effectiveness of the corrective action for one anchor analysis problem which was analyzed after completion of the corrective action.

Page  $\underline{1}$  of  $\underline{1}$ 

02530

### DIVISION OF E

|            |                                                                                                                                                          | CEB '82 1117 022                                                                                                                                                      |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|            |                                                                                                                                                          | REPORT NO. VBNCEB6233                                                                                                                                                 |
| 2          | PLANT Watts Bar                                                                                                                                          | [3] UNIT 1                                                                                                                                                            |
| <u>a</u>   | PREPARER/ORGANIZATION/DATE C G WARRET/TPE                                                                                                                | E-CEB-PAS2/11-9-82                                                                                                                                                    |
| 5          | io nodes ioc, 27% and 310 do s nor ha                                                                                                                    | t i and 2 analyses. The unit i anchor design ave calculations to support the anchor load are nonconservative. This may not be the ce further investigation is needed. |
|            |                                                                                                                                                          | 84022700150                                                                                                                                                           |
|            |                                                                                                                                                          |                                                                                                                                                                       |
| <u> </u>   | DATE OF OCCURRENCE EST ( 3), ACT. ( ) 1/80                                                                                                               | SIGNIFICANT CONDITION ADVERSE TO QUALITY                                                                                                                              |
| ᆚ          | METHOD OF DISCOVERY Black & Veatch Review                                                                                                                | YES NO                                                                                                                                                                |
|            |                                                                                                                                                          |                                                                                                                                                                       |
| 8          | UNID CODE (EN DES-EP 8.01)                                                                                                                               | 10 BRANCH CHIEF/DATE SERVINE 11/17/82                                                                                                                                 |
| _          | CORRECTIVE ACTION: GENCEB8302 was written t result of this generic NCR, all anchor lo                                                                    | o address an error in the anchor program. As a                                                                                                                        |
| <b>=</b> . | CORRECTIVE ACTION: GENCEB8302 was written to result of this generic NCR, all anchor lotthe above-stated deficiency will have the                         | o address an error in the anchor program. As a lads on WBN will be rerun and documented. Therefor                                                                     |
| <b>-</b>   | CORRECTIVE ACTION: GENCEB8302 was written to result of this generic NCR, all anchor lotthe above-stated deficiency will have the                         | o address an error in the anchor program. As a lads on WBN will be rerun and documented. Therefor                                                                     |
| <b>-</b>   | CORRECTIVE ACTION: GENCEB8302 was written to result of this generic NCR, all anchor lotthe above-stated deficiency will have the                         | o address an error in the anchor program. As a lads on WBN will be rerun and documented. Therefor                                                                     |
| -          | CORRECTIVE ACTION: GENCEB8302 was written to result of this generic NCR, all anchor lotthe above-stated deficiency will have the                         | o address an error in the anchor program. As a lads on WBN will be rerun and documented. Therefor                                                                     |
| <b>-</b>   | CORRECTIVE ACTION: GENCEB8302 was written to result of this generic NCR, all anchor lotthe above-stated deficiency will have the                         | o address an error in the anchor program. As a lads on WBN will be rerun and documented. Therefor                                                                     |
| <b>-</b>   | CORRECTIVE ACTION: GENCEB8302 was written to result of this generic NCR, all anchor lotthe above-stated deficiency will have the                         | o address an error in the anchor program. As a lads on WBN will be rerun and documented. Therefor                                                                     |
| 1          | CORRECTIVE ACTION: GENCEB8302 was written to result of this generic NCR, all anchor lotthe above-stated deficiency will have the                         | to address an error in the anchor program. As a lads on WBN will be rerun and documented. Therefore anchors recalculated in accordance with the                       |
|            | CORRECTIVE ACTION: GENCEB8302 was written to result of this generic NCR, all anchor to the above-stated deficiency will have the revised anchor program. | TREQUIREMENT  YES NO SECURITION REQUEST NO.                                                                                                                           |

| 110 |                                                                                                                                                                                                           |                          | ्रास्त्रीक्षण्यः कृत्यों क्षण्यः । इतः स्कृतः | Supplement.              | and the second                           |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------------------------------------|--------------------------|------------------------------------------|
| a   | ASSIGNABLE CAUSE: PROGUED IF SIGNIFICANT requirement of the analyst. As a tre not always readily available.                                                                                               | m Hierofi<br>result, cal | lining of the endor<br>culations to suppor    | t the maker law          |                                          |
|     |                                                                                                                                                                                                           |                          |                                               |                          |                                          |
|     | •                                                                                                                                                                                                         |                          |                                               |                          |                                          |
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|     | •                                                                                                                                                                                                         |                          |                                               |                          |                                          |
|     |                                                                                                                                                                                                           |                          |                                               |                          |                                          |
| 1   | THIS IS A GENERIC CONDITION YES                                                                                                                                                                           | ] NO[]                   |                                               |                          |                                          |
|     | ACTION REQUIRED TO PREVENT RECURRENCE:                                                                                                                                                                    | (REQUIRED IF S           | IGNIFICANTI All anch                          | ors on WBN will b        | 16                                       |
| 1 e | calculated and documented. The ancording to the following criteria:                                                                                                                                       | chor progra              | m printouts will be                           | microfilmed and          | filed                                    |
| 1.  |                                                                                                                                                                                                           |                          | · load she minen                              | ***                      | 1 - 2 - 2 - 2 - 2                        |
| •   | will be filed with the analysis                                                                                                                                                                           | problem tha              | anaiyzed, the miclo<br>t was last reanalyz    | filmed anchor ioa<br>ed. | d printout                               |
| 2.  | If one side of the anchor is alto                                                                                                                                                                         | ernatelv an              | alvzed and the other                          | r side is risorou        | • lv                                     |
|     | analyzed, the microfilmed anchor analyzed side.                                                                                                                                                           | load print               | out will be filed w                           | ith the rigorousl        | у                                        |
| 3.  | The area of the difficient 13 CLD                                                                                                                                                                         | alternatel               | y analyzed and the                            | other side is lig        | orously                                  |
|     | analyzed, anchor loads will be to<br>for the loads on that analysis an                                                                                                                                    | re microfil              | med and referenced                            | in the respective        | nrohlem                                  |
|     | Documentation EN DES-EP 3.56 will microfilming of anchor loads.                                                                                                                                           | l have a se              | ction concerning the                          | documentation a          | nd                                       |
|     | microtitiming or anchor roads.                                                                                                                                                                            |                          | ,                                             | •                        | , (                                      |
|     |                                                                                                                                                                                                           |                          |                                               |                          | - 411                                    |
| 1   | *QA ENGINEER REVIEW AND CONCURRENCE:                                                                                                                                                                      | · .                      |                                               | 35Mal                    | 10/1 - 10/1 B                            |
| =-  | *QA ENGINEER REVIEW AND CONCURRENCE:                                                                                                                                                                      | мн [21]                  | _ <del></del>                                 | JEMeC                    | ard 11 19 18                             |
| 1   | LABOR EST. ( ), ACT. ( )                                                                                                                                                                                  | MH 21                    | SCHEDULE EST. ( ), ACT.                       |                          | 0                                        |
|     | LABOR EST. ( ), ACT. ( )                                                                                                                                                                                  |                          | _ <del></del>                                 | ( )                      | 0                                        |
|     | LABOR EST. ( ), ACT. ( ) ACTIVITY NO. [23] TASK I REMARKS:                                                                                                                                                | DESCRIPTION              | SCHEDULE EST. ( ), ACT.                       | ( )  24 DATE INITIATE    | 0<br>0                                   |
|     | LABOR EST. ( ), ACT. ( ) ACTIVITY NO. [23] TASK I                                                                                                                                                         | DESCRIPTION              | SCHEDULE EST. ( ), ACT.                       | ( )  24 DATE INITIATE    | 0 10 10 10 10 10 10 10 10 10 10 10 10 10 |
|     | LABOR EST. ( ), ACT. ( ) ACTIVITY NO. [23] TASK I REMARKS:                                                                                                                                                | DESCRIPTION              | SCHEDULE EST. ( ), ACT.                       | ( )  24 DATE INITIATE    | 0 10 10 10 10 10 10 10 10 10 10 10 10 10 |
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|     | LABOR EST. ( ), ACT. ( ) ACTIVITY NO. [23] TASK I REMARKS:                                                                                                                                                | DESCRIPTION              | SCHEDULE EST. ( ), ACT.                       | ( )  24 DATE INITIATE    | 10 NH                                    |
|     | ACTIVITY NO. 23 TASK I REMARKS: This NCR is superceded by NCR WBNC                                                                                                                                        | DESCRIPTION EB8233 RI,   | MEDS accession numb                           | ( )  24 DATE INITIATE    | 10 NH                                    |
|     | LABOR EST.( ), ACT.( )  ACTIVITY NO.                                                                                                                                                                      | DESCRIPTION EB8233 RI,   | SCHEDULE EST. ( ), ACT.                       | ( )  24 DATE INITIATE    | 10 19 1                                  |
|     | LABOR EST. ( ), ACT. ( )  ACTIVITY NO. [23] TASK I  REMARKS:  This NCR is superceded by NCR WBNC  DISTRIBUTION:  CONST PROJECT MANAGER EN DES PROJECT MANAGER QAB                                         | DESCRIPTION EB8233 RI,   | MEDS accession numb                           | ( )  24 DATE INITIATE    | ord 1 191                                |
|     | LABOR EST. ( ), ACT. ( )  ACTIVITY NO. [23] TASK I  REMARKS:  This NCR is superceded by NCR WBNC  DISTRIBUTION: CONST PROJECT MANAGER EN DES PROJECT MANAGER                                              | EB8233 RI,               | MEDS accession numb                           | er CEB 831229 009        | ord night                                |
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|     | ACTIVITY NO. 23 TASK I REMARKS: This NCR is superceded by NCR WBNC DISTRIBUTION: CONST PROJECT MANAGER EN DES PROJECT MANAGER QAB OEDC QA NEB (for Significant NCR's)**                                   | EB8233 RI,               | MEDS accession numb                           | er CEB 831229 009        | ord n M                                  |

# DIVISION OF ENGINEERING DESIGN NONCONFORMANCE REPORT

MEDS Accession No SWP '83 0125 178

| · -               |                                                                                                                                                                                                                                                                   |                                                                                                                                                                 | NSWT8309   |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <del></del>       | WATTS BAR NUCLEAR PLANT                                                                                                                                                                                                                                           | [3 UNIT ]                                                                                                                                                       |            |
|                   | EPAHER-ORGANIZATION DATE R. L. Ilich/SWP/J                                                                                                                                                                                                                        | anuary 25, 1983                                                                                                                                                 |            |
| •                 | SCHIPTION OF CONDITION                                                                                                                                                                                                                                            |                                                                                                                                                                 |            |
| for<br>Rev<br>43. | c anchors 47A060-3-8 and 47A060-3-10 fail tree in the z-direction as required by Designision 1 of 47A060-3-8 allows 25.8 percent 3 percent of the load in the z-direction, ansferred through the anchor to the other shits a load transferred through anchor to 1 | n Criteria WB-DC-40-31.15, section /<br>and revision 2 of 47A060-3-10 allows<br>applied on one side of the anchor, to<br>side. Section 7.1.4 of the design cri- | 1.4.<br>be |
|                   |                                                                                                                                                                                                                                                                   | 840420E024                                                                                                                                                      | 8 (3       |
|                   |                                                                                                                                                                                                                                                                   |                                                                                                                                                                 | _          |
|                   |                                                                                                                                                                                                                                                                   |                                                                                                                                                                 |            |
|                   |                                                                                                                                                                                                                                                                   |                                                                                                                                                                 | •          |
|                   |                                                                                                                                                                                                                                                                   |                                                                                                                                                                 |            |
|                   |                                                                                                                                                                                                                                                                   |                                                                                                                                                                 |            |
| DA                | TE OF OCCURRENCE EST (X ), ACT ( ) 12/8/80                                                                                                                                                                                                                        | 9 SIGNIFICANT CONDITION ADVERSE TO QUALITY                                                                                                                      |            |
| <del></del>       | Black & Veatch                                                                                                                                                                                                                                                    | 1                                                                                                                                                               |            |
|                   | Findings F-319 & F-324  ID CODE (EN DES EP 8.01) 47                                                                                                                                                                                                               | 10 BRANCH CHIEF DATE A CHET IN                                                                                                                                  |            |
| ٠                 | ID CODE IT THE DESET BOTH 47                                                                                                                                                                                                                                      | - Starans                                                                                                                                                       | 1.22-8     |
|                   | 10 CODE 114 TICS ET 0.011 - 47                                                                                                                                                                                                                                    | Joanas                                                                                                                                                          | 1·25-E     |
| 1] co             | HRECTIVE ACTION                                                                                                                                                                                                                                                   | J. Darage                                                                                                                                                       | 1.75-8     |
|                   | RRECTIVE ACTION                                                                                                                                                                                                                                                   | 1 Darage                                                                                                                                                        | 1.75-8     |
| Box               | HRECTIVE ACTION  x anchors 47A060-3-8 and 47A060-3-10 were r                                                                                                                                                                                                      | redesigned under ECN 3511 to meet the                                                                                                                           | 1·75·8     |
| ب<br>Bo≥          | RRECTIVE ACTION                                                                                                                                                                                                                                                   | redesigned under ECN 3511 to meet the                                                                                                                           | 1.75-8     |
| ب<br>Bo≥          | HRECTIVE ACTION  x anchors 47A060-3-8 and 47A060-3-10 were r                                                                                                                                                                                                      | redesigned under ECN 3511 to meet the                                                                                                                           | 1.75-8     |
| ب<br>Bo≥          | HRECTIVE ACTION  x anchors 47A060-3-8 and 47A060-3-10 were r                                                                                                                                                                                                      | redesigned under ECN 3511 to meet the                                                                                                                           |            |
| ب<br>Bo≥          | HRECTIVE ACTION  x anchors 47A060-3-8 and 47A060-3-10 were r                                                                                                                                                                                                      | redesigned under ECN 3511 to meet the                                                                                                                           | 1.75-8     |
| ب<br>Bo≥          | HRECTIVE ACTION  x anchors 47A060-3-8 and 47A060-3-10 were r                                                                                                                                                                                                      | redesigned under ECN 3511 to meet the                                                                                                                           |            |
| ب<br>Bo≥          | HRECTIVE ACTION  x anchors 47A060-3-8 and 47A060-3-10 were r                                                                                                                                                                                                      | redesigned under ECN 3511 to meet the                                                                                                                           |            |
| ب<br>Bo≥          | HRECTIVE ACTION  x anchors 47A060-3-8 and 47A060-3-10 were r                                                                                                                                                                                                      | redesigned under ECN 3511 to meet the                                                                                                                           |            |
| <br>Box           | HRECTIVE ACTION  x anchors 47A060-3-8 and 47A060-3-10 were r                                                                                                                                                                                                      | redesigned under ECN 3511 to meet the                                                                                                                           |            |
| ب<br>Bo≥          | HRECTIVE ACTION  x anchors 47A060-3-8 and 47A060-3-10 were r                                                                                                                                                                                                      | redesigned under ECN 3511 to meet the                                                                                                                           |            |
| ب<br>Bo≥          | HRECTIVE ACTION  x anchors 47A060-3-8 and 47A060-3-10 were r                                                                                                                                                                                                      | redesigned under ECN 3511 to meet the                                                                                                                           |            |
| <br>Box           | HRECTIVE ACTION  x anchors 47A060-3-8 and 47A060-3-10 were r                                                                                                                                                                                                      | redesigned under ECN 3511 to meet the                                                                                                                           |            |
| ب<br>Bo≥          | HRECTIVE ACTION  x anchors 47A060-3-8 and 47A060-3-10 were r                                                                                                                                                                                                      | redesigned under ECN 3511 to meet the                                                                                                                           |            |
| ب<br>Bo≥          | HRECTIVE ACTION  x anchors 47A060-3-8 and 47A060-3-10 were r                                                                                                                                                                                                      | redesigned under ECN 3511 to meet the                                                                                                                           |            |
| ب<br>Bo≥          | HRECTIVE ACTION  x anchors 47A060-3-8 and 47A060-3-10 were r                                                                                                                                                                                                      | redesigned under ECN 3511 to meet the                                                                                                                           |            |
| ب<br>Bo≥          | HRECTIVE ACTION  x anchors 47A060-3-8 and 47A060-3-10 were r                                                                                                                                                                                                      | redesigned under ECN 3511 to meet the                                                                                                                           |            |
| ے۔<br>Box         | HRECTIVE ACTION  x anchors 47A060-3-8 and 47A060-3-10 were r                                                                                                                                                                                                      | redesigned under ECN 3511 to meet the                                                                                                                           |            |
| ب<br>Bo≥          | HRECTIVE ACTION  x anchors 47A060-3-8 and 47A060-3-10 were r                                                                                                                                                                                                      | redesigned under ECN 3511 to meet the                                                                                                                           |            |
| ب<br>Bo≥          | HRECTIVE ACTION  x anchors 47A060-3-8 and 47A060-3-10 were r                                                                                                                                                                                                      | redesigned under ECN 3511 to meet the DC-40-31.15, section 7.1.4.                                                                                               |            |
| Box               | HRECTIVE ACTION  x anchors 47A060-3-8 and 47A060-3-10 were r                                                                                                                                                                                                      | redesigned under ECN 3511 to meet the DC-40-31.15, section 7.1.4.                                                                                               |            |
| Box<br>sti        | HRECTIVE ACTION  x anchors 47A060-3-8 and 47A060-3-10 were riffness requirements of design criteria WB-                                                                                                                                                           | redesigned under ECN 3511 to meet the DC-40-31.15, section 7.1.4.                                                                                               | 1.75-8     |

NONCONFORMANCE REPORT T REPORT NO WBNSWP8309 [16] ASSIGNABLE CAUSE TREQUIRED IT SIGNIFICANTI The stiffness of anchors 47A060-3-8 and 47A060-3-10 failing to meet the requirements of design criteria WB-DC-40-31.15 is due to inadequate design and checking. THIS IS A GENERIC CONDITION ACTION REQUIRED TO PREVENT RECURRENCE (REQUIRED IF SIGNIFICANT) All support designers involved in box anchor design have been notified in writing (WBP 840213 021) of the latest stiffness requirements as specified by design input memorandum on piping system anchor criteria WB-DC-40-31.15 (CEB 830603 028). Designers have also been trained in the application of EP 4.25, Design Review and Interface Coordination of Detailed Construction and Procurement Drawings. Post 'INDEPENDENT REVIEW N/A20 LABOREST | 1, ACT ( ) SCHEDULE EST ( ), ACT ( DAYS ACTIVITY NO N/A 23 TASK DESCRIPTION 24 DATE INITIATED N/A 22 Additional corrective action by CONST is being tracked by ECN 3511. 26 ALL EN DES ACTION COMPLETE [27] DISTRIBUTION R. L. Ilich, 375 GB-K CONST PROJECT MANAGER EN DES PROJECT MANAGER CHIEF, ESB OFFICE OF QA NEB (for Significant NCRs)\*\* MEDS CIS 016 MEB '840409 ASSISTANT TO THE MANAGER OF GEDC (Quality and Nuclear Safety)—for Significant NCRs
DISTRIBUTE AFTER THIS SIGNATURE

MEDS ACCESSION NO.

HANDCARRY COPY TO NEB-NLS

# EN DES NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

### NCR NO. WBN5WP8309

SIGNIFICANT YES ME NO D REPORTABLE YES D NO D

- A. Have any analyses, contracts, memorandums, etc., requiring EN DES work been generated? Yes ps No D If yes, list in (C) below.
- B. Have all ECNs related to the NCR been issued?

  N/A □ Yes ♥ No □ If yes, list in (C) below.
- C. Documents related to the NCR (ECN, analyses, memos, contract No., etc.)

|                               | REF OR MEDS<br>ACCESS. NO. | COMPLETION DATE |
|-------------------------------|----------------------------|-----------------|
| ANCHOR DRAWING                | 47A060-3-8 R2              | 8/10/23         |
| 17A060-3-8 ANCHOR CALES       | WBP840123 050              | 1/23/84         |
| MYCHOR DRAWING                | 47A060-3-10 R3             | 8/10/83         |
| 47A060-3-10 AMEHON CALES      | WBP 840123017              | 1/2414          |
| REQUIREMENTS NOTHERATION MONO | WBP840213021               | 2/13/84         |
| ECN 3611 CLOSURE SHEET        | WBP840321526               | 3/21/84         |

- E. Has all necessary EN DES information been transmitted to an organization outside EN DES to enable the completion of work required?
  Yes R No O N/A O If yes, list in (C) above.
- F. Is all EN DES action complete? Yes 

   No □

Organization tracking No. ECN 3511

G. Remarks:

D.

Verified By Roba D. Mich Date 4/2/84

Page \_\_\_ of \_\_\_

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TVA 10700A (EN DES--12/83)

# DIVISION OF ENGINEERING DESIGN NONCONFORMANCE REPORT

MEDS Accession No. SWP 83 0209 047

WBNSWP8312 T REPORT NO PLANT WATTS BAR NUCLEAR PLANT UNIT PREPARER/ORGANIZATION/DATE J. R. Holloway/SWP/February 9, 1983 DESCRIPTION OF CONDITION Black and Veatch Review Finding No. F-325 In the original calculations for anchor supports 47A060-3-9 and 47A060-3-11 (Calculation No. WMG 2015), the method of analysis used for determining the structural adequacy was found to be in error. The original designer had mistakenly input the units for the applied forces as (1bs x  $10^{-3}$ ) into the SAGS computer program. The result of this type of input would be that the computer could allow member stresses to far exceed the member yield stress. In this particular case, for these two anchors, the loads happened to be low enough such that when the program was rerun using the correct yield stress value it was found to still be adequate. Due to the possible implications of this deficiency a sample from three other systems was reviewed and from the results of this sample, it was determined that this was an isolated case. 840507E0478 DATE OF OCCURRENCE EST & 1, ACT ( ) 12/10/80 9 SIGNIFICANT CONDITION ADVERSE TO QUALITY METHOD OF DISCOVERY Black & Veatch Rev (F-325) 10 BRANCH CHIEF DATE UNID CODE (EN DES-EP 8.01) 2 9 83 11 CORRECTIVE ACTION Calculations were redone using correct applied forces. No further action is necessary. 12 CORRECTIVE ACTION DEVIATES FHOM A DESIGN CRITERIA REQUIREMENT 13 DESIGN CRITERIA DOCUMENT NO. **EXCEPTION REQUEST NO** 14 ECN REQUIRED NO X A CN NO 15 SCHEDULE IMPACT

| NONCONFORMAL                                                                                                       | ICE REPORT                     | WBNSWP831   |
|--------------------------------------------------------------------------------------------------------------------|--------------------------------|-------------|
| 16 ASSIGNABLE CAUSE (REQUIRED IF SIGNIFICANT)                                                                      |                                | -44.34.031. |
|                                                                                                                    |                                |             |
| N/A                                                                                                                |                                | •           |
|                                                                                                                    |                                |             |
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| n                                                                                                                  |                                |             |
| 17 THIS IS A GENERIC CONDITION YES NO X                                                                            |                                |             |
| ACTION REQUIRED TO PREVENT RECURRENCE - IREQUIRED IF SIGNI                                                         | FICANTI                        |             |
| N/A                                                                                                                |                                |             |
| W/ D                                                                                                               |                                |             |
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| O SINDERENDENT DEVISE OF A D THE A D                                                                               |                                |             |
| D LABOR EST. ( ), ACT. ( ) MH (2) SC                                                                               | /                              | <del></del> |
| 2 ACTIVITY NO 23 TASK DESCRIPTION                                                                                  | HEDULE EST ( ), ACT ( )        | D/          |
| REMARKS                                                                                                            | 24 DATE INITIAT                | ED .        |
|                                                                                                                    |                                |             |
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| DISTRIBUTION:<br>CONST PROJECT MANAGER                                                                             | 26 ALL EN DES ACTION COMPLETE: |             |
| EN DES PROJECT MANAGER CHIEF, ESB                                                                                  | 1011 10 100                    |             |
| OFFICE OF QA NEB (for Significant NCRs)**                                                                          | Like Sandly / Sty              | 1-4-14      |
| MEDS CIS VISRS (for Significant NCRs)*                                                                             | BRANCH CHIE TORG.              | DATE        |
| ASSISTANT TO THE MANAGER OF DEDC (Quality and Nuclear Safety) And Spiritions NCRs  DISTRIBUTE AFTER THIS SIGNATURE | MCB 840427                     | 013,        |
|                                                                                                                    |                                |             |

# EN DES NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

### NCR NO. WANSWP1312

SIGNIFICANT YES D NO MA REPORTABLE YES O NO K

Verified By 1/2 Date 3/2 /in

- A. Have any analyses, contracts, memorandums, etc., requiring EN DES work been generated? Yes O No X If yes, list in (C) below.
- B. Have all ECNs related to the NCR been issued? N/A M Yes O No O If yes, list in (C) below.
- C. Documents related to the NCR (ECN, analyses, memos, contract No., etc.)

|                                                                            | REF OR MEDS<br>ACCESS. NO.       | COMPLETION DATE       |
|----------------------------------------------------------------------------|----------------------------------|-----------------------|
| SUPPORT CACULATION (47A060-3-9)                                            | <u>w8p94030504</u>               | 3/5/84                |
| SUPPORT CALCULATING (47A060-3-11)                                          | WBP840305041                     | 3/5/84                |
| ·                                                                          |                                  |                       |
| Is action by organization outside EN Organization tracking No.             | DES required?                    |                       |
| Has all necessary EN DES information outside EN DES to enable the completi | been transmitt<br>on of work req | ed to an organization |
| Is all EN DES action complete? Yes M                                       | , No 🗆                           |                       |
| Remarks:                                                                   |                                  |                       |

Page 1 of 1

TVA 10700A (EN DES--12/83)

## DIVISION OF ENGINEERING DESI HONCONFORMANCE REPORT

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|          |                                                                                                                                                                                                                                                                     |                        |                   |                                                                              | UE                  | R OS I                               | 12:                         | , 0      | UI          |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------|------------------------------------------------------------------------------|---------------------|--------------------------------------|-----------------------------|----------|-------------|
|          |                                                                                                                                                                                                                                                                     |                        |                   |                                                                              | 1                   | 1 REPORT                             | w WE                        | NCEB8    | 232         |
| া        | PLANT Watts Bar                                                                                                                                                                                                                                                     |                        |                   |                                                                              | •                   | MIT 8 L AT                           |                             |          |             |
| H        | PREPARER/ORGANIZATION/DATE_C QC Wagner/TPE-CE                                                                                                                                                                                                                       | B-PA                   | S2.               |                                                                              | 31 ,                | <b>241</b> 5 4 40                    |                             |          |             |
| i        | DESCRIPTION OF CONDITION                                                                                                                                                                                                                                            |                        |                   |                                                                              |                     |                                      |                             |          |             |
|          | The support design load of 1850 pounds indivariable spring at node 133 is inaccurate. 0600200-02-05 have an overlap region with tanalysis confirms nor is within 10 percent. The NCR was caused probably while transposito the support load table and was not caugh | An<br>the<br>of<br>ing | ind<br>ind<br>the | ysis problem<br>clusion of n<br>e recorded s<br>mbers from t<br>the checker. | ode<br>uppo<br>he c | 3-3-4A and<br>133. Nei<br>ort design | ither<br>n value<br>orintou | e.<br>it | )           |
| •        | DATE OF OCCURRENCE EST ( X ), ACT. ( ) 1/82                                                                                                                                                                                                                         | <u>a</u>               | 81                | GNIFICANT CONE                                                               |                     |                                      | O QUALIT                    | Y        |             |
| 0        | METHOD OF DISCOVERY Black & Veatch Review                                                                                                                                                                                                                           | 10                     | •                 | YES T                                                                        |                     |                                      | 01                          | اله      | <del></del> |
| <b>a</b> | UNID CODE (EN DES-EP 8.01)                                                                                                                                                                                                                                          | 110                    | 1                 | En T                                                                         | */=-                | SPERCO                               | an                          | A I      | 1/39/       |
| $\Box$   | CORRECTIVE ACTION:                                                                                                                                                                                                                                                  |                        | <i>• ()</i>       | 77-1 1-3-                                                                    | -/-                 |                                      |                             |          |             |
|          | An evaluation of the deficiency exposed improproblem 0600200-02-05. The analysis was rean Analysis Handbook, section 200, which explain the work was performed under ECN 3511.                                                                                      | aly                    | zec               | following                                                                    | the                 | WBN Rigor                            | ous                         |          |             |
|          |                                                                                                                                                                                                                                                                     |                        |                   |                                                                              |                     |                                      |                             |          | i           |
| 1        |                                                                                                                                                                                                                                                                     |                        |                   |                                                                              |                     |                                      |                             |          |             |
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| }        |                                                                                                                                                                                                                                                                     |                        |                   |                                                                              |                     |                                      |                             |          |             |
| 12       | CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQU                                                                                                                                                                                                              | HREN                   | 4EN               | T YES                                                                        |                     | NO 🔀                                 |                             |          |             |
| 13       | DESIGN CRITERIA DOCUMENT NO.                                                                                                                                                                                                                                        |                        |                   | EXCEPTION                                                                    | REQ                 | UEST NO.                             |                             |          |             |
| 1        | ECN REQUIRED TYPES NO ECN NO. 3                                                                                                                                                                                                                                     | 511                    |                   | 11 20                                                                        | EDU                 | LE IMPACT                            | <u> </u>                    | <u> </u> | _ ×         |
|          |                                                                                                                                                                                                                                                                     |                        |                   |                                                                              |                     |                                      |                             |          |             |

|              | ·                                                              | MOI        | HOOHFORM.  | MICE REPORT  |                | I REPORT NO.   | •          | Y     |
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| 1            | ASSIGNABLE CAUSE: (REQUIRED IF SIG                             | SNIFICANT) |            |              |                |                |            | •     |
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|              |                                                                |            |            |              | ē              |                |            |       |
| n            | THIS IS A GENERIC CONDITION                                    | YES 🗌      | NO 🗌       | <del></del>  | <del></del>    |                |            |       |
| <del>_</del> | ACTION REQUIRED TO PREVENT RECU                                |            |            | GMIEICANTI   |                | <del></del>    |            |       |
| ٔ کیب        | I THE TO THE TERM NEGOT                                        | Incu       | omeo ir si | GIVET IGANTE |                |                |            |       |
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| 11           | 19A ENGINEERGENIEMENC COMOURE                                  | encerx Ini | DEPENDENT  | REVIEW:      | لكممذ          | W. Pipe        | µ~ 18.     | 113   |
| _            | LABOR EST. ( ), ACT. ( )                                       |            | MH 21      | SCHEDULE ES  | T. ( ), ACT. ( |                |            | DA    |
| _            | ACTIVITY NO. 2                                                 | TASK DESC  | RIPTION    |              | •              | 24 DATE INITIA | ATED       |       |
| 25           | REMARKS:                                                       |            |            |              |                |                |            |       |
|              |                                                                |            |            |              |                |                |            |       |
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| 27           | DISTRIBUTION:                                                  |            |            | DES ACTION   | OMPLETE:       | 1/2 St         |            | n /a. |
| 28           | CONST PROJECT MANAGER<br>EN DES PROJECT MANAGER<br>CAS         |            | JAE        |              | BRA            | NCH CHIEF/ORG. | _ <i>4</i> | ATE   |
|              | OÈOC QA<br>NEBYfor Significant NCR's)**                        |            |            |              |                |                |            |       |
| _            | MEDS NSRS (for Significant NCR's)                              |            |            |              |                |                |            | •     |
|              | * DISTRIBUTE AFTER THIS SIGNATURE ** HANDCARRY COPY TO NEB-NLS | .          |            | CER'S        | 40402          | 2 003          |            |       |

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# EN DES NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

NCR NO. WENCEBB232

SIGNIFICANT YES D NO M REPORTABLE
YES D NO X

- A. Have any analyses, contracts, memorandums, etc., requiring EN DES work been generated? Yes ロ No p If yes, list in (C) below.
- B. Have all ECNs related to the NCR been issued? N/A □ Yes 其 No □ If yes, list in (C) below.

H. Remarks:

C. Documents related to the NCR (ECN, analyses, memos, contract No., etc.)

|    | •                                                                                                 |                   | STATUS                     | 5            |
|----|---------------------------------------------------------------------------------------------------|-------------------|----------------------------|--------------|
|    |                                                                                                   | ACCESS. NO.       | WORKING<br>(see (F) below) | COMPLETE     |
|    | ECN 3511                                                                                          | WBP840321526      |                            |              |
|    |                                                                                                   |                   |                            | <del>*</del> |
|    |                                                                                                   |                   |                            |              |
|    |                                                                                                   |                   |                            |              |
|    |                                                                                                   |                   |                            | •            |
|    |                                                                                                   |                   |                            |              |
| D. | Is action by organization outside E Organization tracking No. (NCR, QCI                           | N DES required?   | Yes □ No 📜                 |              |
| E. | Has all necessary EN DES informatio outside EN DES to enable the comple Yes D No N/A If yes, list | tion of work reau | d to an organization       | on           |
| F. | If any document listed in (C) above item 26 on the NCR cannot be signed                           | is indicated in   | the working status         | block,       |
| G. | Is all EN DES action complete? Yes                                                                | ¥ No □            |                            |              |

Verified By Roger Auffill Date 3-26-84

LPII /JWH RIMS

KC'.

GRD



# UNITED STATES NUCLEAR REGULATORY COMMISSION REGION II

101 MARIETTA STREET, N.W. ATLANTA, GEORGIA 30323

APR 17 1385

ATTN: Mr. H. G. Parris 1.44 850423 142-Manager of Power and Engineering

500A Chestnut Street Tower II Chattanooga, TN 37401

Gentlemen:

SUBJECT: REPORT NOS. 50-390/85-35 AND 50-391/85-29

On April 1-4, 1985, NRC inspected activities authorized by NRC Construction Permit Nos. CPPR-91 and CPPR-92 for your Watts Bar facility. At the conclusion of the inspection, the findings were discussed with those members of your staff identified in the enclosed inspection report.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observation of activities in progress.

Within the scope of the inspection, no violations or deviations were identified.

Should you have any questions concerning this letter, please contact us.

Sincerely,

David M./Verrelli, Chief Reactor Projects Branch 1 Division of Reactor Projects

Enclosure:

Inspection Report Nos. 50-390/85-35 and 50-391/85-29

cc w/encl:

W. T. Cottle, Watts Bar Nuclear Plant Site Director

E. R. Ennis, Plant Manager

J. W. Anderson, Manager

Office of Quality Assurance

K. W. Whitt, Chief, Nuclear Safety Staff

cc w/encl: (con't see page 2)

RECEIVED

APR 22 1985

NUCLEAR LICENSING BRANCH

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CHATTANOOGA, TENN.

APR 2 2 1985

MANAGER OF POWER AND ENGINEERING

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cc w/encl: (cont'd)
R. Pierce, Watts Bar Nuclear Plant Project Manager

D. L. Williams, Jr., Supervisor

Licensing Section

K. D. Mali, Project Engineer

D. B. Ellis, Project Engineer

G. Wadewitz, Construction Project Manager

M. J. Burzynski, Regulatory and Engineering Section



# UNITED STATES NUCLEAR REGULATORY COMMISSION REGION II 101 MARIETTA STREET, N.W. ATLANTA, GEORGIA 30323

Report Nos.: 50-390/85-35 and 50-391/85-29

Licensee: Tennessee Valley Authority

500A Chestnut Street Chattanooga, TN 37401

Docket Nos.: 50-390 and 50-391

License Nos.: CPPR-91 and CPPR-92

Facility Name: Watts Bar 1 and 2

Inspection Conducted: April 1-4, 1985

Inspector: 51 US

Pate Signed

Approved by: Disk

J./J. Blake, Section Chief

Engineering Branch

Division of Reactor Safety

Date Signed

### SUMMARY -

Scope: This routine, announced inspection involved 28 inspector-hours at the Engineering Design Offices in Knoxville, Tenneesee, in the areas of seismic analysis for as-built safety-related piping systems and pipe support baseplate designs using concrete expansion anchor bolts.

Results: No violations or deviations were identified.

### REPORT DETAILS

#### Persons Contacted 1.

Licensee Employees

\*T. C. Cruise, Project Engineer, Office of Engineering (OE)

\*G. Cantiz, Project Managers Office

\*J. Ellis, Senior Engineer, Civil Engineering Branch (CEB) \*D. H. Level, Civil Engineer, CEB

\*J. W. McReynolds, Assistant to Branch Chief, CEB

\*G. Owens, Nuclear Engineer, OE

\*N. Perry, Senior Civil Engineer, OE \*W. R. Sirett, Section Supervisor, OE

Other licensee employees contacted included engineers, technicians and

\*Attended exit interview

#### 2. Exit Interview

The inspection scope and findings were summarized on April 4, 1985, with those persons indicated in paragraph 1 above. The inspector described the areas inspected and discussed in detail the inspection findings listed below. No dissenting comments were received from the licensee.

The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspector during this inspection.

### 3. Licensee Action on Previous Enforcement Matters

(Closed) Unresolved Item (URI) 390/82-27-09, "Analytical Techniques used in Piping Analysis." The inspector held discussions with responsible licensee representatives and reviewed supporting documentation to verify that the unresolved items identified in Inspection Report 50-390/82-27 have been addressed. The unresolved items in the report have been identified in paragraph 8 as 8a.(1), 8a.(2) and Subparagraphs 8a.(1) and 8a.(3) were closed in Inspection Report 50-390/84-78. The inspector reviewed the following documents to assure compliance of the licensee's response to the unresolved items:

# Subparagraph 8 a.(2)

WBN-RAH-200 Policy No. 1, dated April 25, 1983

"Dynamic Overlapping"

Impell Report No. 03-0060-1057, Revision O, dated August 1983

"Evaluation of the Overlap Piping Method for Watts Bar Nuclear Plant"

NCR Gen CEB 8215, closed out November 9, 1983, and TVA memo from Standifer to Wadewitz dated April 1, 1985, RE: TVA Response/Position.

- (Closed) Violation 390/85-18-01, "Improper Design of Pipe Support 4/A496-5-14 RI". The inspector held discussions with responsible licensee representatives and reviewed supporting documentation to verify that the violation identified has been addressed. The licensee has issued a Nonconformance Report (NCR) to resolve the instability of the support. The support has been redesigned. determined this is an isolated case. To prevent potential recurrence, designers have been instructed in the requirements stated in Watts Bar Pipe Support Design Manual, Section 7.1, Revision 2, titled, "Things to Avoid in the Design of Pipe Supports." This item is considered closed.
- (Open) Unresolved Item 390/84-05-05, "Friction Force Considerations for Pipe Support Design". The inspector held discussions with responsible licensee representatives and reviewed supporting documentation to verify that the concern identified has been resolved. The licensee has reviewed 2001 Unit 2 pipe supports to provide a basis for a quantitative assessment that the effects of friction were of little significance and had no effect on overall design of a support for Unit 2. At the time of this inspection, the licensee had not yet completed their final review. This item remains open pending further review of Unresolved Items

Unresolved items were not identified during the inspection.

### 5. Licensee Identified Items

- (Closed) Item 390/85-10 and 391/85-10, "Design Errors of Drawing 47W491-8" (10 CFR 50.55(e)). The final report was submitted on March 11, 1985. The report has been reviewed and determined to be March 11, 1985. acceptable. The inspector held discussions with responsible licensee representatives, reviewed supporting documentation and observed representative samples of work to verify that the corrective actions
- (Closed) Item 390/85-12 and 391/85-13, "Failure to Identify A Water Spray Hazard" (10 CFR 50.55(e)). The final report was submitted on March 22, 1985. The report has been reviewed and determined to be Ь. acceptable. The inspector held discussions with responsible licensee representatives, reviewed supporting documentation and observed representative samples of work to verify that the corrective actions

# DISTRIBUTION SHEET FOR

| PLANT(s) \4( \alpha \ \R \)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| PLANT(s) Works Bar ITEM NO. 1 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |               |
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| SUBJECT Routine Salety Inspection April 1 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1/85-29       |
| SUBJECT Routine Safety Inspection April 1-4 1985 Inspector                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |               |
| GENERAL NOTE (PRO-                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | •             |
| Attachment Ko Violations or deviations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |
| cc (Artachana) Special                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |
| A. P. Bianco                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Special       |
| V. A. Bianco. ( H. Gabbard ( )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Instr.        |
| M. N. Bresslon                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ( )           |
| () R. H. Brunne () T. E. Hayron () L. Michlink                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ( )           |
| ()() T. G. Chapman () E1-BFN () () H. G. O'Brien () L. H. Chin () P. G. Ioannides () ()(X) Jah.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ()            |
| () R. F. Christia () R. M. Jessea () John A. Raulston                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ( )           |
| D. T. Clift (N) H. L. Jones (D) G. Renfro                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ()            |
| () R. A. Costner () () K. D. Keith () () C. E. Roberts () J. F. Cox () () D. L. Kitchel () () E. R. Taylor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ( )           |
| () W. L. Ellione () L. J. Klass () R. C. Weir                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ( )           |
| D. G. Fickey () P. A. Koontz () D. K. Williams                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | $\dot{}$      |
| WBN, Field Serv. () () L. W. Lau () () D. L. Williams Bldg, OE () E. A. Merrick () Dan W. Wilson                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ( )           |
| (+) Personal Attention () P. D. Metcalf                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ( )           |
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| () RIMS, SL26 C-K () () R. M. Parker, W4C126 C-K                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | )             |
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| ( ) Standifer P-10/                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | )             |
| () J. P. Vineyard, A8 Sequoyah ENG (                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | )             |
| L. S. Cox. BLN OC (2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ,             |
| () G. Wadewitz, WBN OC (3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <i>)</i><br>) |
| Special Instructions:  ( ) J. T. Barnes, BLN OC QA  ( ) A. W. D.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |
| Special Instructions: (X) A. W. Rogers, WBN OC QA (                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | )<br>)        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | •             |

# RIGOROUS ANALYSIS HANDBOOK POLICY STATEMENT

Policy No. 1 Section No. WBN-RAH-200

PLANT: WATTS BAR NUCLEAR PLANT

SUBJECT: DYNAMIC OVERLAPPING

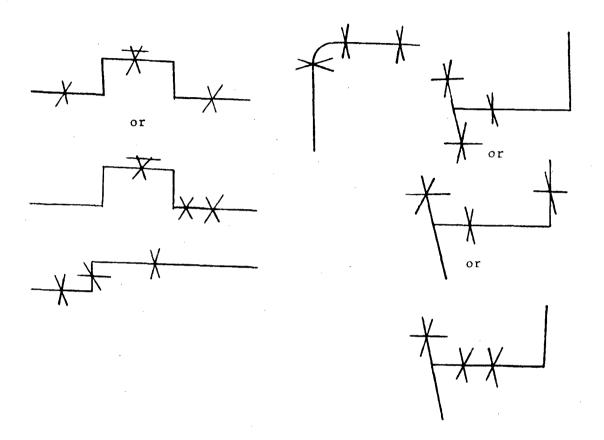
DATE: APR 2 5 1983

The interface of two rigorously analyzed problems should be terminated with one of the following requirements for the dynamic case.

- 1. A structural anchor can be built which uncouples the problems. However, for some cases, this is not economically feasible. A stress intensification factor of 2.1 should be used in the analysis for the termination anchor. Tee anchors and inline anchors are acceptable.
- 2. The problems may be dynamically overlapped. Structural enveloping is a procedure for analyzing the dynamic response of a piping system by performing a separate analysis on subsystems of a complete structure. The model being analyzed is extended into the adjacent problem to form a common region. Transfer of dynamic loading across the common region should be minimized. To accomplish this structural isolation, the common region must be supported to minimize the transmittal of bending, axial, and torsion movements.

The following sketches illustrate the minimum requirement for overlapped regions to be utilized when evaluating the acceptability. Three closely spaced lateral supports and one axial support is required. It is acceptable for one of the lateral supports to act as an effective axial support. All supports must be rigid during a seismic event. Torsion must be restrained.

### Minimum configurations are:



Support loads in the overlapped region must be enveloped. The overlapped region will be shown by dashed lines and lap point designations. A note will be placed on the support load table designating which support loads are enveloped. A note will be included on the isometric identifying the other problem.

### EXECUTION PROCEDURE

PROGRAM: ANCHOR Software ID 262235

version: 3.0

DATE: March 8, 1984

COMPUTER FAMILY: KBN

EXECUTION INSTRUCTIONS: -ANCHOR

The above execution instructions are maintained and validated for use by the Civil Engineering Support Branch. These are the only controlled procedures for executing the program with use of this manual.

AAAA AAAAAA AAAAAAAA AAAAAAAAA 00000 RPRRPR CCCCC HH EH NNN NN AAAAA HH 00 00 RR 22 田 CC NNNN NN AAAAA AAAA 00 RR 2 HE ER 00 AAAA NN NN NN CC AAAAA 00 RFRRR HEREHER 00 CC AAAAA NNNNNN HH 00 00 PR PR AAAAAAAAAAAAAAAAA CC HH NN NN RR 00 00 RR NN CC EH HE NN **AAAAAAAAAAAAAAAAAAAA** 00000 RP RR EH HH NN CCCCC NN AAAAAAA

Software ID 262235

ANCEOR LOAD PROGRAM

USER MANUAL

TENNESSEE VALLEY AUTHORITY

EN DES

VERSION 3.0

MARCH 8, 1984

Version 1.0 March 15, 1976, J. E. McCord, Author Version 2.0 May 6, 1983, D. W. Hargroves Version 3.0 March 8, 1984, B. E. Cline

### REVISION/SIGNATURE SHEET

Title: ANCHOR, Anchor Load Program

| Rev. | Description of Revision                                                                                                                                                                                                                                                                                                                                                                                                        | Prepared by:<br>Signature/Date       | Reviewed by:<br>Signature/Date                 |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------------------------------------------------|
| RO   | Version 1.0. Original version of the code.                                                                                                                                                                                                                                                                                                                                                                                     | J. E. McCord<br>3/15/76<br>J. EM Cid | Dietrich Riffert<br>11-14-81<br>Victor Riffert |
| Rl   | Version 2.0. Revised per NCR 8302. Both the input and output have been modified regarding the direction cosines option. All references to the record and input coordinate systems has been removed. Modified to automatically calculate the direction cosines used to define the local coordinate system based on global plant coordinates. Output modified to report loads in the global and local coordinate systems. Stress | D. W. Hargroves 5/6/83  Am Halffurs  | Dave Loewus 5/18/83  David Lourus              |

R2 Version 3.0. Revised the ANCHOR LOADS IN THE LOCAL COORDINATE SYSTEM table to remove unconservative results which occurred when the anchor coordinate system was not colinear with the global coordinate system.

difference (reserve stress) is no longer input or reported.

> B. E. Cline 3/8/84

K. A. Brune
3/8/84

Bubara E. Cline Kinneth a Bound mles fil (Interpretation)

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#### 1.0 PROGRAM DESCRIPTION

The ANCHOR program is designed to evaluate anchor design information required for the design of a plate and shell or a structural type anchor. Since load cases are defined internally to the ANCHOR program, it is intended to be used for ice-condenser plants, specifically Watts Bar and Sequoyah, but can be utilized for other plants by combining other load cases into those defined for the ANCHOR program. The program is designed to be specifically compatable with TPIPE and in all but special cases, all input to ANCHOR can and should come directly from the TPIPE input and output. Forces, moments and their corresponding coordinate systems are input and then combined in the global coordinate system, and a local coordinate system based on global coordinates inline to the run of pipe connected to the anchor.

The analyst should prepare an input deck as described in Section 3.0. Loads are imposed on an inline anchor from two sides, generally given by two separate TPIPE analyses. Forces and moments are extracted from the PIPING SYSTEM REACTIONS table of TPIPE keeping the signs in all cases. If a non-global coordinate system has been defined in the TPIPE run using direction cosines, the analyst should extract these directly from the input data echo (not extensive data check). ANCHOR will transpose these loads back into the Global coordinate system. Loads and direction cosines are extracted in similar manner from the TPIPE analysis for the other side of the anchor, which may have a different coordinate system definition. These are similarly transposed into the Global coordinate system and combined per the equations in Section 2.0. Loads will be reported in this Global coordinate system.

Since the anchor load designer is usually interested in the local loads imposed on the anchor, the analyst should supply the Global coordinates of the anchor and a point inline to the run of pipe connected to the anchor to define this local coordinate system. The intent is to keep local—x axial to the pipe, local—z lateral to the pipe (in the horizontal plane), and local—y following the right hand rule (y=z cross x). Local—x is directed from the anchor to the inline point, local—z is local—x crossed into GLOBAL—Y, and local—y is local—z cross local—x. The analyst should specify the anchor node name from the TPIPE analysis and the inline point node name related to these coordinates (if the TPIPE coordinates are not absolute plant global coordinates, the analyst must convert them to GLOBAL!). ANCHOR will refer to these node names in the BPRINT (an issuable load table printout) to define the local coordinate system.

For special cases of curved pipe for which there is no inline point, it is suggested that the analyst define a point in space lying on a line tangent to the pipe at the anchor point. The <u>inline</u> point node name should be left blank in this case and the BPRINT will refer to the global coordinates of this point instead of the node name to define local-x. A TPIPE control point may be used as an inline point for anchors at or near an elbow. For cases where the pipe is vertical, ANCHOR defines local-x as GLOBAL-Y, local-y as GLOBAL-X and

local-z as minus GLOBAL-Z -- even if the inline point is below the anchor point. After the input deck is complete per Section 3.0, the analyst may execute ANCHOR per Section 7.0.

Most piping systems require revised analysis after the original issue to reflect changes made in the piping system. To prevent future revisions from affecting the redesign of supports and anchors and to keep minor changes from requiring the reissue of anchor load drawings, rounding techniques are used to increase the design loads slightly to account for this. If no rounding is requested (Section 3.0), loads will be rounded up to the nearest 10. If rounding is requested, loads will be increased 10 percent and then rounded to the nearest 10.

All Nomenclature, special symbols, and definitions discussed in the following sections are given in Appendix C. Governing equations and theory used in ANCHOR are given in Section 2.0.

#### 2.0 ASSUMPTIONS AND LIMITATIONS

The philosophy of anchor load evaluation differs from the support loads calculated in TPIPE. In evaluating the maximum secondary loads for supports, all the load sources are assumed to act simultaneously, and the load calculated is consequently conservative. Anchor design, however, presents a difficult problem in designing the unit rigid enough to be effective. Consequently, the secondary load sources are considered to act simultaneously only when it is actually possible to do so. To accomplish this, an intermediate step in the load calculation is added in which the containment pressure transient loads are combined with the appropriate thermal mode loads prior to being used for anchor load evaluation. When calculating the secondary load combinations in this manner, care must be taken to handle both sides of an inline anchor in the same manner.

If the loads are known for both sides of the anchor, the total load for that analysis will first be calculated before applying the following equations. The loads for both sides will be added for CP, TH, DW, PL, WH, CS, and VT analysis. The loads for both sides will be absolute value addition for CT, S1, S2, DM, E1, and E2.

Each of the following are tabulated for consideration in the design of anchors. Note that thermal conditions can be shown to be acting for each plant condition by the use of scale factors.

SNP = Scale factor for upset condition

SFD = Scale factor for faulted upset with DM condition

SFA = Scale factor for faulted condition after DM

Three secondary loads must be evaluated. For each thermal mode:

Secondary upset - Normal

$$SUP+ = (TI+ + /S1/) * SNP$$
  
 $SUP- = (TI- - /S1/) * SNP$ 

Secondary faulted - DM, S2

$$SF1+ = (TI+ + /DM/ + /S2/) * SFD$$
  
 $SF1- = (TI- - /DM/ - /S2/) * SFD$ 

Secondary faulted - CP, CT, S2

$$SF2+ = (TI+ CP+ + /CT/ + /S2/) * SFA$$

SF2- = (TI- CP- - /CT/ - /S2/) \* SFA

Secondary faulted loads are listed below:

SF+ = Larger of SF2+, SF1+, AND SUP+ SF- + Smaller of SF2-, SF1-, AND SUP-

Normal Condition - Primary - Equation EN

L8N = /DW + PL + CS/

Normal condition - Primary + secondary - Equation 11

Lll+ = Larger of 0 and DW + PL +CS +SUP+

L11- = Smaller of 0 and DW + CS + SUP-

Ll1 = Larger of Ll1+ and /Ll1-/

Upset condition - Primary - Equation 9

L9U+ = Larger of 0 and DW + PL + CS + WH+ +/E1/ + vt+L9U- = Smaller of 0 and DW + PL + CS + WH- -/E1/ + VT-

L9U = Larger of L9U+ and /L9U-/

Upset - Primary + secondary

L9S+ = Larger of 0 and DW + PL + CS + SUP+ + WH+ +/E1/

L9S- = Smaller of 0 and DW + P1 + CS + SUP- + VT- + WH- -/E1/ L9S = Larger of L9S+ and /L9S-/

Faulted - Equation 9

L9F+ = Larger of 0 and DW + PL + CS + WH+ + VT+ +/E2/ L9F- = Smaller of 0 and DW + PL + CS + WH- + VT- -/E2/

Faulted = Primary + secondary - Limit

L9T+ = Larger of 0 and DW + PL + CS + SF+ + VT+ + WE+ +/EE/

L9T- = Smaller of 0 and DW + PL + CS + SF- + WH- -/EE/

Figure 1.0 is an example of the final design information format for anchor evaluation.

Anchor loads for time history load cases and for analyses with more than one deadweight loadcase may be unconservative. The following message has been included in the output from ANCHOR to notify the user of this fact.

\*\*\*\*\*\*\*\*\* WARNING \*\*\*\*\*\*

VERSION 3.0 OF THE ANCHOR LOAD PROGRAM CAN GIVE UNCONSERVATIVE RESULTS IF TIME HISTORY LOAD CASES ARE INPUT OR IF MORE THAN ONE DEADWEIGHT LOAD CASE IS INPUT

\*\*\*\*\*

R2

FIGURE 1.0

# ANCHOR DESIGN REQUIREMENTS

| Code<br>Equation | Condition<br>Normal | Loading<br><u>Type</u> | Design Loads*                                                                                                          |
|------------------|---------------------|------------------------|------------------------------------------------------------------------------------------------------------------------|
| 8N               | Normal              | Primary                | L = /DW + PL + CS/                                                                                                     |
| 11               | Normal              | Primary +<br>Secondary | $L^+ = DW + PL + CS + SUP^+$<br>$L^- = DW + PL + CS + SUP^-$                                                           |
| 9 <b>U</b>       | Upset               | Primary                | $L^{+} = DW + PL + CS + VT^{+} + WH^{+} + /E1/$<br>$L^{-} = DW + PL + CS + VT^{-} + WH^{-} - /E1/$                     |
| 9 <b>F</b>       | Faulted             | Primary                | $L^{+} = DW + PL + CS + /E2/ + WH^{+} + VT^{+}$<br>$L^{-} = DW + PL + CS - /E2/ + WH^{-} + VT^{-}$                     |
| N/A              | Upset               | Primary +<br>Secondary | $L^{+} = DW + PL + CS + SUP^{+} + VT^{+} + WH^{+} + /E1/$<br>$L^{-} = DW + PL + CS + SUP^{-} + VT^{-} + WH^{-} - /E1/$ |
| N/A              | Faulted             | Primary +<br>Secondary | $L^{+} + DW + PL + CS + SF^{+} + VT^{+} + WH^{+} + /EE/$<br>$L^{-} = DW + PL + CS + SF^{-} + VT^{-} + WH^{-} - /EE/$   |

<sup>\*</sup>Use the larger of  $L^+$  and  $/L^-/$ .  $L^+$  is the larger of  $L^+$  and 0.  $L^-$  is the smaller of  $L^-$  and 0.

# 3.0 INPUT REQUIREMENTS

The input sequence for ANCHOR card types are shown in Figure 2.0. The coding requirements for each card type follow.

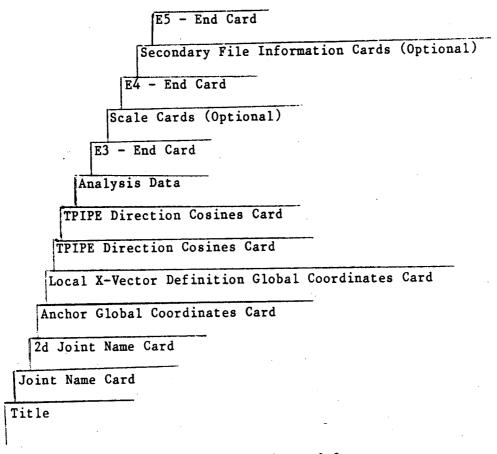


Figure 2.0

# Title Card (One required)

| Column | Format | <u>Variable</u> | Description |
|--------|--------|-----------------|-------------|
| 1-80   | 10A8   | TITLE           | Title       |

# Joint Name Card

| Column | Format | <u>Variable</u> | Description                                                           |
|--------|--------|-----------------|-----------------------------------------------------------------------|
| 1      | Al ·   | IH              | Data = None                                                           |
| 2-5    | A4     | JT              | Joint name                                                            |
| 7      | Al     | LM              | Rounding code. Code "R" for round, "N" for not rounded. (N = default) |

| 10    | Al    | NP    | Option to print on special paper.<br>Code nonblank for no print.     |
|-------|-------|-------|----------------------------------------------------------------------|
| 11-20 | F10.4 | sc    | Scale factor for final design loads, before rounding. Default = 1.00 |
| 21-80 | 6A10  | COM , | Comments to be printed on special paper.                             |

# Second Joint Name Card

| Column | <u>Format</u> | <u>Variable</u> | Description                              |
|--------|---------------|-----------------|------------------------------------------|
| 1      | A1            | IH              | Data = None                              |
| 2-5    | A4            | JT1             | Joint name                               |
| 21-80  | 6A10          | COM1            | Comments to be printed on special paper. |

# Anchor Global Coordinates Card

| Column | Format | <u>Variable</u> | <u>Description</u>            |
|--------|--------|-----------------|-------------------------------|
| 1-10   | A10    | NA(1)           | Anchor node name              |
| 11-20  | F10.4  | GL(1,1)         | Global X-Coordinate of Anchor |
| 21-30  | F10.4  | GL(1,2)         | Global Y-Coordinate of Anchor |
| 31-40  | F10.4  | GL(1,3)         | Global Z-Coordinate of Anchor |

# Local-x Vector Definition Global Coordinates Card

| <u>Column</u> | <u>Format</u> | <u>Variable</u> | Description            |
|---------------|---------------|-----------------|------------------------|
| 1-10          | A10           | NA(2)           | Inline Point Node Name |
| 11-20         | F10.4         | GL(2,1)         | Global X-Coordinate    |
| 21-30         | . F10.4       | GL(2,2)         | Global Y-Coordinate    |
| 31-40         | F10.4         | GL(2,3)         | Global Z-Coordinate    |

The local-x vector definition global coordinates should specify a point inline to the pipe connected to the pipe. Local-x will be directed from the anchor to this point.

<u>Direction Cosine Cards from TPIPE</u> (one card for each side required)

| <u>Column</u> | <u>Format</u> | <u>Variable</u> | Description                                        |
|---------------|---------------|-----------------|----------------------------------------------------|
| 1             | A1            | IH              | None                                               |
| 2-5           | a4            | JT              | Joint name                                         |
| 10            | 12            | 18              | Anchor side number (1 or 2).                       |
| 11-20         | F10.4         | B(1)            | X<br>xs                                            |
| 21-30         | F10.4         | B(2)            | Y Global projection from xs TPIPE of direction xs. |
| 31-40         | F10.4         | B(3)            | Z<br>xs                                            |
| 41-50         | F10.4         | B(4)            | X<br>ys                                            |
| 51-60         | F10.4         | B(5)            | Y Global projection from ys TPIPE of direction ys. |
| 61-70         | F10.4         | B(6)            | Z<br>ys                                            |
| 71-80         | A10           | C1              | Comment                                            |

These global projections are taken directly from the TPIPE run. These must technically be direction cosines for ANCHOR, so if any one of the TPIPE projections are greater than 1.0, the TPIPE projections must be unitized before entry into ANCHOR.

| Analysis                | <u>Data</u>             | Cards (One ca   | rd for each joint for each load source)                            |
|-------------------------|-------------------------|-----------------|--------------------------------------------------------------------|
| Co lumn                 | Format                  | <u>Variable</u> | Description                                                        |
| 1                       | A1                      | IH              | Data = None                                                        |
| 2-5                     | A4                      | JT              | Joint name                                                         |
| 7-8                     | A2                      | IT ·            | Load source. See figure 3.0                                        |
| 10                      | 11                      | IS              | Side number.                                                       |
| 11-20<br>21-30<br>31-40 | F10.4<br>F10.4<br>F10.4 | FX<br>FY<br>FZ  | Forces (lbs) from TPIPE PIPING SYSTEMS REACTIONS TABLE (Keep sign) |

| 41-50 | F10.4 | FX | Moments (ft. 1b.) from TPIPE PIPING SYSTEMS REACTIONS TABLE (Keep sign). |
|-------|-------|----|--------------------------------------------------------------------------|
| 51-60 | F10.4 | FY |                                                                          |
| 61-70 | F10.4 | FZ |                                                                          |
| 71-80 | A10   |    | Comments                                                                 |

End Card (one card required after the above set of cards)

| Co lumn | Format | <u>Variable</u> | Description |
|---------|--------|-----------------|-------------|
| 1       | Al     | · IH            | Date = "E"  |

# ANCHOR

# Figure 3.0

# ANALYSIS CODES - LOAD SOURCES

| Code       | Description          | <u>Note</u> |
|------------|----------------------|-------------|
| CS         | Cold Spring          | 1           |
| CP         | Containment pressure | 1           |
| CT         | Containment thermal  | 2,5         |
| DM         | DEA anchor movements | 3,5         |
| DW         | Deadweight           | 4           |
| E1         | OBE                  | 2,5         |
| E2         | SSE                  | 2,5         |
| PL         | Preload              | . 1         |
| S1         | OBE anchor movements | 1           |
| S2         | SSE anchor movements | 3,5         |
| V1         | Valve thrust No. 1   | 1           |
| ₹2         | Valve thrust No. 2   | 1           |
| W1         | Water hammer No. 1   | 1           |
| W2         | Water hammer No. 1   | 1           |
| Tl         | •                    |             |
| T2         |                      |             |
| т3         |                      |             |
| <b>T</b> 4 |                      | _           |
| <b>T</b> 5 | Thermal modes        | 1           |
| Т6         | •                    |             |
| <b>T7</b>  | •                    |             |
| <b>T8</b>  |                      |             |
| Т9         | •                    |             |
| T10        |                      |             |

### Notes:

- 1. Only one load set of data for side is expected. Values are replaced.
- 2. Values from more than one case are enveloped.
- 3. Values from different load cases are added with absolute values.
- 4. Keep the sign of the largest value.
- 5. Values are reversing.

<u>Scale cards</u> Load case to be created by scaling an existing load case (previous input section)

| Column | Format | <u>Variable</u> | <u>Description</u>                                  |
|--------|--------|-----------------|-----------------------------------------------------|
| 1 .    | A1     | JH              | Data = None                                         |
| 3-4    | A2     | IC              | Data = "SC" for scale analysis                      |
| 6-7    | A2     | IT1             | Type of data to manipulated. See figure 3.0         |
| 10     | 11     | IS1             | Side number (1 or 2)                                |
| 17-18  | A2     | IT2             | Analysis type of data to be created. See figure 3.0 |
| 21     | 11     | IS2             | Side number (1 or 2)                                |
| 23-30  | F8.4   | SC              | Scale factor                                        |

End Card (One card after the set of above cards)

| Column | Format | <u>Variable</u> | <u>Description</u> |
|--------|--------|-----------------|--------------------|
| 1      | Al .   | JН              | Data = "E"         |

# Secondary Load File Cards 1

| Column | Format | <u>Variable</u> | Description                                           |
|--------|--------|-----------------|-------------------------------------------------------|
| 1      | Al     | IH              | Data = None                                           |
| 3-4    | A2     | IT1             | Code T1, T2, T3, T4, T5, etc. <sup>2</sup>            |
| 11-20  | F10.2  | SCP             | Upset condition scale factor for this thermal mode    |
| 21-30  | F10.2  | SCT             | Faulted (DM-S2) scale factor for this thermal mode    |
| 31-40  | F10.2  | SDM             | Faulted (CT-CT-S2) scale factor for this thermal mode |

 $<sup>^{\</sup>mathrm{l}}$  See discussion on Secondary Load Evaluation in Section 2.0 for explanation of the requirements for this entry.

 $^{2}\mathrm{If}$  this Code is not specified, scale factors will be ignored.

End Card (One card after the above cards)

| Column | Format | <u>Variable</u> | <u>Description</u> |
|--------|--------|-----------------|--------------------|
| 1      | A1     | IH              | Data = "E"         |

#### 4.0 OUTPUT DESCRIPTION

Appendix D contains a complete listing of an example problem for the ANCHOR program. ANCHOR will print the banner page listing the program title and version number twice. This insures that the banner page will always be the first page of the printout to easily distinguish the run when combined in the calculation package.

ANCHOR provides an input data echo with both an upper and lower column number scale to verify correct entry of data. This is an exact replication of the input data deck and thus also provides verification of the data input.

After the data echo, ANCHOR provides an extensive data check with error checking. The direction cosines which define the local coordinate system for the anchor (calculated from the input global coordinates specified for the anchor and the inline point) are shown relative to the global coordinate system. The angles between these components and the major coordinate axes are also shown. Next are the direction cosines from TPIPE and their respective angles. After listing the loads input from each side, (in the input coordinate system from TPIPE) loads are shown in the global coordinate system for each side and then combined in the global coordinate system. Design loads are then summarized for equations:

8N Normal 11 Normal 9U Upset Upset 9F Faulted Faulted

and rounded using conventions discussed in Section 1.0. Loads are then also presented similarily in the local coordinate system for the anchor. The local coordinate system is defined by ANCHOR based on the anchor and inline points specified. When requested by the analyst, (prompted at execution time) an issuable design load table (referred to as the BPRINT) will be produced. An example of this BPRINT is shown as the last page of Appendix D.

Error Messages which may be listed by ANCHOR are:

- 1. Number of joints exceeds array limit of:\_\_\_\_\_
- 2. Error Wrong key parameter in this section No action.
- 3. Error Wrong analysis type:\_\_\_\_.
- 4. Error Type must be thermal No action.
- 5. Error Joint name card missing or in the wrong sequence.

| 6. | No such analysis type as:                                          |
|----|--------------------------------------------------------------------|
| 7. | No such joint as: is input as a restrained joint.                  |
| 8. | Warning - Local vectors are not orthogonal. Input:,, Calculated:,, |
| 9. | Error - Direction cosine does not equal a unit vector.             |
|    | Error - At least one direction cosine vector is greater than 1.0.  |

#### 5.0 EXAMPLE PROBLEM DESCRIPTION

The example problem in Appendix D is for anchor node point 120 on problem N3-XX-XXX and has loads imposed on it from one side only. Local-x for the anchor is directed from the anchor to node point (or control point) CO1. The local coordinate system is based on the global coordinates specified for these nodes. The local coordinate system defined by ANCHOR indicates that the local coordinate system is: Local-x is Global-Z, Local-y is Global-Y and Local-z is minus Global-X. The loads are convented from a local coordinate system in TPIPE having direction cosines of: -.3214, .7600, -.5567. Loads from the TPIPE PIPING SYSTEMS REACTIONS TABLE are entered with the corresponding load case group ID. Load case S2 is twice load case S1. Loads are reported in the Global and Local systems as discussed in Sections 1.0 and 4.0. The BPRINT (last page of Appendix D) defines the local coordinate system in terms of the inline node point: CO1.

# 6.0 TYPICAL RUN STATISTICS

The ANCHOR program run is submitted interactively. Program execution time will generally be complete in less than 30 seconds wall clock time depending upon the host computer workoad. The CPU time for a typical problem is 2.5 secs. Total SBUs for a typical problem is 5.3 UNTS on the Cyber 175.

# 7.0 EXECUTION INSTRUCTIONS AND REQUIREMENTS

Version 3.0 of the ANCHOR program may be executed interactively on the CDC computer system by typing:

#### -ANCHOR

This procedure file will prompt the user for all information required to execute the ANCHOR program including the input file name, BPRINT options, output disposal, etc.

# APPENDIX A

| U                                        | AN EURTHERTUR MERT                                               | UN SUFTIMAKE SUMMAKT        | ATTACHMENT NO. 1                      |
|------------------------------------------|------------------------------------------------------------------|-----------------------------|---------------------------------------|
| OL SUMMARY DATE 02. SUMMARY PREF         | ARED BY:                                                         | ` `                         | 03. PREVIOUS SOFTWARE 1D              |
| YR./HO./DAY J. D. L                      | DEWUS                                                            |                             | 000000                                |
| OS. SOFTWARE TIT                         | ILE<br>LOAD PROGRAM                                              |                             |                                       |
| OR SOFTWARE DATE YR. /HO. /DAY           | ·                                                                |                             |                                       |
| 703/12                                   |                                                                  |                             | 07. NEW SOFTWARE 10 262235            |
| 06 JOKI TITLE                            | ESSING MODE 10.                                                  | APPLICATION                 | AREA                                  |
| 08. SOFTWARE TYPE 09. PROC               | ESSING HODE 10.                                                  | GENERAL                     | SPECIFIC                              |
| COMPUTER PROGRAM BATC                    | RACTIVE COMPUTER SUPPORT UT  H SCIENTIFIC/E  BIBLIOGRAP  TEXTUAL | NGINEERING PROCESS CONTROL  |                                       |
| 11. SUBHITTING ORGANIZATION A            |                                                                  | 12. TECHNICAL               | CONTACT(S)                            |
| COMPUTER SERVICES                        | S AND STRUCTURAL AN<br>ENGINEERING DESIGN                        | ALYSI J.D. L                | DEWUS                                 |
| W9A17 C-K<br>KNOXVILLE ,TN 379           | 902                                                              |                             | -                                     |
| MOMENTS ARE OBTAINED SUCH AS DEAD WEIGHT | TWO SIDES OF A PIPE<br>O FROM STRUCTURAL P<br>, THERMAL , SEISMI | ANCHOR. THESE FORCE         | AMS FOR LOAD CASES NCHOR LOAD PROGRAM |
|                                          | •                                                                |                             |                                       |
| ·                                        | ,                                                                | •                           |                                       |
|                                          |                                                                  |                             |                                       |
|                                          |                                                                  | च्चर <sup>:</sup>           | _                                     |
|                                          |                                                                  |                             |                                       |
|                                          |                                                                  |                             | •                                     |
|                                          |                                                                  | •                           |                                       |
| 2680WYZX                                 |                                                                  |                             |                                       |
|                                          | URE VESSEL , ANCHO                                               | R LOAD , LOAD COMBI         |                                       |
| 15. COMPUTER MANUF'R                     | 16. COMPUTER OPERATING<br>SYSTEM                                 | 17. PROGRAMMING LANGUAGE(S) | 18. NUMBER OF SOURCE STATEMENTS       |
| AND MODEL                                | NOS                                                              | FORTRAN IV                  | 700                                   |
| CDC/176                                  | 20. TAPE DRIVES                                                  | 21. DISK/DRUN UNITS         | 22. TERMINALS                         |
| REQUIREMENTS                             | NONE                                                             | NONE                        | NONE                                  |
| 6 OK                                     | NONE                                                             | NONE                        | NONE                                  |
| 23. OTHER OPERATIONAL REQUIR - NONE      | CHENIS                                                           |                             |                                       |
| 24. SOFTWARE AVAILABILITY                |                                                                  | 25. DOCUMENTATION AVAILABIL | .ITY                                  |
| 1                                        | HITED IN-HOUSE ONLY                                              | AVAILABLE IN                | DEQUATE IN-HOUSE ONLY                 |
|                                          |                                                                  |                             |                                       |
| A D.C. AHTHODIS                          |                                                                  | 27. QUALITY ASSURANCE       |                                       |
| JON E MCCORD                             |                                                                  | PROGRAM CONFORMS TO         | EN DES-EP 3.23                        |
|                                          |                                                                  | CLASS 1                     | CLASS !!                              |

IN DES-EP 3.13 D1 Attachment No. 2 Page 1 of 2

# Checklist for Program Documentation

|            |                                                                                                                   | PROGRAM ANCHOR Reviewer TR Hor Extension #- 890 | Very :     |
|------------|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|------------|
| 1.         | Class I program                                                                                                   |                                                 |            |
| 2.,        | Class, II                                                                                                         |                                                 |            |
| (          | The following ixems apply for Class I prog                                                                        | rams.                                           |            |
| 3.         | Source code available.                                                                                            |                                                 |            |
| <i>i</i> . | INPUT and OUTPUT files provided for verif                                                                         | isation                                         | L/         |
| 5.         | Verification documentation adequate                                                                               |                                                 |            |
|            | The following items apply for Class II pro                                                                        | grams.                                          |            |
|            | User manual.                                                                                                      |                                                 |            |
| 6.         | Title page                                                                                                        |                                                 | <u></u>    |
|            | <ul><li>a. Software title</li><li>b. Author</li><li>c. Responsible organization</li><li>d. Date</li></ul>         |                                                 |            |
| 7.°<br>8.  | Revision page with revision date >> com<br>Sinary or otherwise and date                                           | pile date of<br>e in catlist                    |            |
| 9.         | TVA EN DES software summary                                                                                       |                                                 | _ <i>\</i> |
| 10.        | Program description                                                                                               |                                                 | V          |
|            | <ul><li>a. Purpose and scope</li><li>b. Basic theory</li><li>c. Equations used or calculation rules</li></ul>     | ·                                               |            |
| 11.        | Assumptions and limitations                                                                                       |                                                 | ~          |
| 12.        | Input requirements                                                                                                |                                                 | <u> </u>   |
|            | <ul><li>a. Input format description</li><li>b. Input file names and description</li><li>c. Sample input</li></ul> |                                                 |            |

# EN DES COMPUTER PROGRAMS - QUALITY ASSURANCE PROCEDURES FOR VERIFYING, DOCUMENTING, AND REVISING

| 13. | Output description                                                                                                                                                                                    |                                                  |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
|     | <ul><li>a. Output file names and descriptions</li><li>b. Output explanationpossible different combinations</li></ul>                                                                                  | <u>c/</u>                                        |
|     | of output c. Explanation of error statements d. Sample outputs                                                                                                                                        | <del>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</del> |
| 14. | References to include applicable: codes, standards, manuals, text, and papers with dates, authors, or responsible organization, and publisher                                                         |                                                  |
| 15. | Execution instructions                                                                                                                                                                                | . 5                                              |
|     | General Checks                                                                                                                                                                                        |                                                  |
| 16. | One of the following is available:                                                                                                                                                                    |                                                  |
|     | <ul> <li>a. Source and JCL saved on time sharing with "-FILES"</li> <li>b. Source and JCL stored on cards with Computer Services Section</li> <li>c. Source and JCL saved on magnetic tape</li> </ul> | 1/<br>1/4                                        |
| 17. | Input file names and output file names with descriptions are indicated in the source code with comment cards.                                                                                         |                                                  |
| 18. | Associate files sheet is filled out by Computer Services Section.                                                                                                                                     |                                                  |
| 19. | Verification adequate                                                                                                                                                                                 |                                                  |
| 20. | Other comments                                                                                                                                                                                        | 2,7                                              |
|     |                                                                                                                                                                                                       |                                                  |

#### NOMENCLATURE

The following nomenclature and technical concepts are standard throughout the program. Each section of the program has been formulated using these definitions and concepts. Included is a brief description of the calculations required for stress and support load evaluation which are incorporated into the prgram.

# Load Sources

| Symbol | <u>Description</u>                                                               | TPIPE<br>Support<br><u>Type</u> | <u>Notes</u> |
|--------|----------------------------------------------------------------------------------|---------------------------------|--------------|
| CS     | Cold spring                                                                      | G                               |              |
| CP     | Containment pressure movement occurring after a DBA (does not activate snubbers) | T                               | 1            |
| CT     | Containment thermal movement occurring after a DBA (does not activate snubbers)  | T                               | 1,5          |
| DM     | Dynamic movements associated with a DBA which activates snubbers                 | D                               | 1,2          |
| DW     | Deadweight                                                                       | G                               |              |
| (EA)   | Inertia effects resulting from DBA                                               | D                               | 3            |
| El     | OBE earthquake                                                                   | D                               |              |
| E2     | SSE earthquake                                                                   | D                               | 3            |
| (J1)   | Jet impingement                                                                  |                                 | 4            |
| PL     | Preload                                                                          | G                               | 6            |
| S1     | OBE anchor movements                                                             | D                               |              |
| S2     | SSE anchor movements                                                             | .D                              |              |
| T1     | Thermal modes 1, 2, n. Includes directional anchor movements                     | T                               |              |
| VT     | Valve thrust (relief force)                                                      | D D                             | 7            |
| WH     | Water hammer - Activates snubbers (directional)                                  | D                               |              |
| EE     | The larger of El and E2                                                          | D                               |              |

#### Notes

- See the directive on evaluating systems connected to the SCV for a discussion of the modeling of these loads. It is assumed the CP/CT are applied sufficiently slow not to activate snubbers.
- 2. The DM load case occurs prior to CP/CT.
- 3. EA will not be run as a separate load case. When the line being analyzed is supported by more than one dynamic support to the SCV, the response spectra for the faulted condition will be the envelope of the SSE spectra and the SCV response spectra due to a LOCA. It will be called E2.
- 4. Jl is a valid load case but will not be considered in the analysis phase.
- The radial and tangential movements of the SCV caused by CT are reversing.
- 6. Preload is a sustained force run consisting of a preload in a spring normally used for deadweight support. The run must use a T deck (which assumes springs do not act) with the preload force applied at the point of the spring installation in the direction of the desired force relief.
- 7. Valve thrust is a suddenly applied load which remains constant in direction and which will initially activate a snubber that will subsequently unload. To analyze this loading sequence requires two runs, a T and a D. This is explained in DED EP 21.12. The loads and moments indicated by "VT" in the equations which follow are actually the enveloped results of the VT (T) and the VT (D) runs.

# Data Type

| Symbol | Description                                       |
|--------|---------------------------------------------------|
| E      | Stress difference (lb/in <sup>2</sup> )           |
| F      | Force (pounds)                                    |
| K      | Design load for lugs (pounds)                     |
| L      | Design load for support (pounds) or (foot-pounds) |
| M      | Moments (foot-pounds)                             |
| N      | Lug stress allowable $(1b/in^2)$                  |
| Q      | Design travel (inches)                            |
| R      | Maximum pipe movement (inches)                    |

- S Stress (lb/in<sup>2</sup>)
- T Ratio N/K (1b/in<sup>2</sup>/pound)

#### Equation - Condition

#### Symbol

| 8N | ASME NC-3652 | equation | 8 for | normal | condition | (primary) |
|----|--------------|----------|-------|--------|-----------|-----------|
|    |              |          |       |        |           |           |

- 11 ASME NC-3652 equation 11 for normal condition (primary + secondary)
- PR Pipe rupture equations 9U and 10
- AV Active valve equations 9 and 10
- 9S Upset primary + secondary
- 9T Faulted primary + secondary
- DE Design primary

#### Definitions

- SY = Yield stress of the pipe at design temperature
- $Z = Section modulus = * (mean radius)^2 * the wall thickness (inches<sup>3</sup>)$
- i = Intensification factor (figure NC-3673.2[b]-1)
- $P = Peak pressure (1b/in^2g)$
- $Pr = Design pressure (lb/in^2g)$
- Do = Outside diameter (inches)
- d = Inside diameter (inches)

SH = Hot allowable stress  $(1b/in^2)$ 

 $SC = Cold \ allowable \ stress (1b/in^2)$ 

f = Stress range reduction factor

SA = f(1.25 SC + 0.25 SH) (NC-3611.2)

#### Term Definition

#### AXX<sup>+</sup> means

- (a) A = Data type description
- (b) XX = Load source symbol or equation symbol
- (c) + = Positive design load Is a positive number
  - = Negative design load Is a negative number

#### Support/Load Nomenclature

Primary load - A load which is not self-limiting (DW, [EA], E1, E2, [JI], PL, VT, WH)

Secondary load - A load which is self-limiting (CT, CP, DM, TI, S1, S2)

# Support Categories

Linear - Provides positive stop to movement of a pipe in a particular direction

Standard component - Variable springs, constant force supports or dynamic snubbers

Anchors - Provides positive stop to rotations and deflections in all directions

Α AAA AAAAA AAAAAA AAAAAAAA AAAAAAAAAA AAAAAA AAAAAA NNN CCCC НН HH 00000 RRRRRR NN 00 00 RR RR AAAAAA AAAAAA NNNN NN CC HH HH 00 RR R HH 00 AAAAAA AAAAAA NN NN NN CC HH AAAAAA AAAAAA NN NNNN CC ННННННН 00 00 RRRRR АААААААААААА NN NNN CC HH HH 00 00 RR RR AAAAAAAAAAAAAAAAAAA NN NN CC HH HH 00 00 RŔ RR AAAAAAAAA AAAAAAAAA NN NN CCCC HH HH 00000 RR RR

ANCHOR LOAD PROGRAM

TENNESSEE VALLEY AUTHORITY

VERSION 2.0

MAY 06,1983

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#### \* \* \* \* \* ANCHOR INPUT DATA ECHO \* \* \* \* \*

123456789012345678901234567890123456789012345678901234567890123456789012345678901 ANCHOR LOADS ON ANCHOR 120, PROBLEM N3-XX-XXX, ONE SIDE ONLY LOADS FROM SIDE 1 = TPIPE SIDE 1 RUN 120 N LOADS FROM SIDE 2 = 0 (LOADS FROM ONE SIDE ONLY) 120 -149.6666 708.0000 -88.6666 120 CO1 -149.4666 708.0000 -81.5000 1-.3214 .7600 -.5567 120 120 2 -18.58 -14.29ĐΨ 31.54 27.48 120 DW 1 -9.53 28.56 203.42 258.84 -369.59-524.10 -47.59 THERMAL 1 120 T1 1-269.03 1.91 10.24 .59 -4.96 -1.77120 T2 1 .93 .09 OBE SAM 120 81 1 -.45 -.88 6.66 -.55 -12.98XY OBE 120 E1 1 23.23 15.37 19.15 30.61 45.09 45.90 27.20 30.55 YZ OBE 39.68 45.93 23.81 120 E1 1 14.02 XY SSE 39.22 63.63 67.46 20.34 23.56 120 E2 1 32.78 YZ SSE 120 E2 1 20.40 37.38 65.32 72.10 39.59 43.61 SC S1 1 S2 1 2.0 Ε E

1 2 3 4 5 6 7 8 1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901

9

O

₹``

ANCHOR LOADS ON ANCHOR 120, PROBLEM N3-XX-XXX, ONE SIDE ONLY
120 N 1.0000 LOADS FROM SIDE 1 = TPIPE SIDE 1 RUN
120 LOADS FROM SIDE 2 = 0 (LOADS FROM ONE SIDE ONLY)

# GLOBAL COORDINATES WHICH DEFINE LOCAL COORDINATE SYSTEM

NODE NAME | GLOBAL X | GLOBAL Y | GLOBAL Z |
ANCHOR POINT | 120 | -149.6666 | 708.0000 | -88.6666 |
INLINE POINT | CO1 | -149.6666 | 708.0000 | -81.5000

# LOCAL COORDINATE SYSTEM FOR ANCHOR (RELATIVE TO GLOBAL)

| IN                   | PUT X VECT           | OR .        |             | INPUT Y     | VECTOR      |              | INFILT 7 | VECTOR        |
|----------------------|----------------------|-------------|-------------|-------------|-------------|--------------|----------|---------------|
| X<br>0.0000<br>90.00 | Y<br>0.0000<br>90.00 | Z<br>1.0000 | X<br>0.0000 | Y<br>1.0000 | z<br>0.0000 | X<br>-1.0000 | 0.0000   | Z<br>0.0000   |
| 70.00                | ×0.00                | 0.00        | 90.00       | 0.00        | 90.00       | 180.00       | 90.00    | 90.00 DEGREES |

# INPUT AXIS DIRECTION COSINES (WITH RESPECT TO THE GLOBAL COORDINATE SYSTEM)

| 120 1<br>INPUT X | 3214<br>VECTOR | .7600  | 5567<br>INPUT Y | 0.0000<br>VECTOR | 0.0000 | 0.0000<br>INFUT Z | . VECTOR |                |
|------------------|----------------|--------|-----------------|------------------|--------|-------------------|----------|----------------|
| X                | Υ              | 7      | X               | Y                | Z      | X                 | Y        | 7              |
| 3214             | .7600          | 5567   | .3817           | .6458            | .6612  | .8660             | 0.0000   | 5000           |
| 108.75           | 40.54          | 123.83 | 67.56           | 49.78            | 48.61  | 30.00             | 90.00    | 120.00 DEGREES |
| 120 2            | 0.0000         | 0.0000 | 0.0000          | 0.0000           | 0.0000 | 0.0000            |          | •              |
| INPUT X          | VECTOR         |        | INFLIT Y        | / VECTOR         |        | INPUT Z           | VECTOR   |                |
| X                | Υ .            | Z      | X               | Y                | Z      | X                 | γ .      | 7              |
| 1,0000           | 0.0000         | 0.0000 | 0.0000          | 1.0000           | 0.0000 | 0.0000            | 0.0000   | 1.0000         |
| 0.00             | 90.00          | 90.00  | 20.00           | 0.00             | 90.00  | 90.00             | 90.00    | 0.00 DEGREES   |

#### ANALYSIS DATA (INPUT COORDINATE SYSTEM)

| JOINT             | TYPE            | 8   | FΧ                    | FY                    | FZ                    | мx                     | MY                     | MZ                   | COMMENT                     |
|-------------------|-----------------|-----|-----------------------|-----------------------|-----------------------|------------------------|------------------------|----------------------|-----------------------------|
| 120<br>120<br>120 | DW:<br>11<br>12 | -   | -9.5<br>-269.0<br>1.0 | 28.6<br>203.4<br>-5.0 | 31.5<br>258.8<br>-1.8 | 27.5<br>-369.6<br>10.2 | -18.6<br>-524.1<br>1.9 | -14.3<br>-47.6       | DW<br>THERMAL 1             |
| 120<br>120<br>120 | 51<br>61<br>E1  | 1 1 | 5<br>23.2<br>14.0     | 6.7<br>15.9<br>23.8   | 19.2<br>39.7          | -13.0<br>30.6          | 9<br>45.1              | .6<br>.1<br>45.9     | ORE SAM                     |
| 120<br>120        | E2<br>E2        | 1   | 32.8<br>20.4          | 20.3                  | 23.4<br>45.0          | 45.9<br>39.2<br>72.1   | 27.2<br>43.6<br>39.6   | 30.6<br>67.5<br>43.6 | Y7 HODE<br>XY SAE<br>YZ SAE |

SICAL CD. DATA

# ANCHOR LOADS ON ANCHOR 120, PROBLEM N3-XX-XXX, ONE SIDE ONLY LOADS IN GLOBAL COORDINATE SYSTEM

| LOAD CASE | THE PIPE. MZ 0.0 | LOAD IS ON MY 0.0 | 18 120 ,<br>MX<br>0.0 | JOINT<br>FZ<br>0.0 | SIDE NO.= 1,<br>FY<br>0.0 | DISPLAY-<br>FX<br>0.0 |
|-----------|------------------|-------------------|-----------------------|--------------------|---------------------------|-----------------------|
| CS -      | 0.0              | 0.0               | 0.0                   | 0.0                | 0.0                       | 0.0                   |
| CP        |                  |                   |                       |                    |                           |                       |
| Ċτ        | 0.0              | 0.0               | 0.0                   | 0.0                | 0.0                       | 0.0                   |
| DM        | 0.0              | 0.0               | 0.0                   | 0.0                | 0.0                       | 0.0                   |
| DW        | -20.4            | 8.9               | -23.3                 | 8.4                | 11.2                      | 41.3                  |
| E1        | 69.3             | 52.5              | 66.8                  | 43.4               | 27.9                      | 48.0                  |
|           | 97.6             | 80.4              | 95.3                  | ,68.7              | 39.6                      | 77.4                  |
| E.2       | 0.0.             | 0.0               | 0.0                   | 0.0                | 0.0                       | 0.0                   |
| FL        | 7.9              | 10.4              | 4.6                   | 4.9                | 4.6                       | 3.2                   |
| Si        | 15.7             | 20.9              | 9.2                   | 9.9                | 9.3                       | 6.3                   |
| \$2       | 0.0              | 0.0               | 0.0                   | 0.0                | 0.0                       | 0.0                   |
| V1·       | 0.0              | 0.0               | 0.0                   | 0.0                | 0.0                       | 0.0                   |
| V2        | •                |                   | 0.0                   | 0.0                | 0.0                       | 0.0                   |
| W1        | 0.0              | 0.0               |                       |                    |                           |                       |
| W2        | 0.0              | <b>0.</b> 0       | 0.0                   | 0.0                | 0.0                       | 0.0                   |
| T 1       | -117.0           | -619.3            | -122.5                | 154.9              | -73.1                     | 386.3                 |
| Т2        | -4.7             | 9.0               | -2.1                  | -2.9               | -2.5                      | -3.7                  |
| 13        | 0.0              | 0.0               | 0.0                   | 0.0                | 0.0                       | 0.0                   |
|           | 0.0              | 0.0               | 0.0                   | 0.0                | 0.0                       | 0.0                   |
| T4        | 0.0              | 0.0               | 0.0                   | 0.0                | 0.0                       | 0.0                   |
| 15        | 0.0              | 0.0               | 0.0                   | 0.0                | 0.0                       | 0.0                   |
| TA        | 0.0              | 0.0               | 0.0                   | 0.0                | .0.0                      | 0.0                   |
| 1.7       | 0.0              | 0.0               | 0.0                   | 9.0                | 0.0                       | 0.0                   |
| 18 .      | φ, σ             | 0.0               | 0.0                   | 0,0                | 0.0                       | <b>a.</b> 0           |
| 10        |                  |                   |                       |                    | 0.0                       | (1, ()                |
|           | 11 ()            | (1)               | (1, ()                | 0.0                | 1.1 - 1.1                 | , , , , ,             |

| 1                     | ·                         |                       |     |            | e ger | · · ·      |   |
|-----------------------|---------------------------|-----------------------|-----|------------|-------|------------|---|
| DISPLAY-<br>FX<br>0.0 | SIDE NO.= 2,<br>FY<br>0.0 | JOINT 18<br>FZ<br>0.0 | MX  | LOAD IS ON | ΜZ    | LOAD CASE  |   |
| 0.0                   | 0.0                       | 0.0                   | 0.0 |            | 0.0   | cs         |   |
| 0.0                   |                           | 0.0                   | 0.0 |            | 0.0   | CP         |   |
| 0.0                   | 0.0                       | 0.0                   | 0.0 | 0.0        | 0.0   | ст         |   |
| 0.0                   | 0.0                       | 0.0                   | 0.0 | 0.0        | 0.0   | DM         | , |
| 0.0                   | 0.0                       | 0.0                   | 0.0 | 0.0        | 0.0   | DW         |   |
| 0.0                   | 0.0                       | 0.0                   | 0.0 | 0.0        | 0.0   | E1<br>E2   |   |
| 0.0                   | 0.0                       | 0.0                   | 0.0 | 0.0        | 0.0   | FL         |   |
| 0.0                   | 0.0                       | 0.0                   | 0.0 | 0.0        | 0.0   | \$1        |   |
| 0.0                   | 0.0                       | 0.0                   | 0.0 | 0.0        | 0.0   | \$2        |   |
| 0.0                   | 4                         | 0.0                   | 0.0 |            | 0.0   | V1         | • |
| 0.0                   |                           | 0.0                   | 0.0 |            | 0.0   | · V2       |   |
| 0.0                   |                           | 0.0                   | 0.0 |            | 0.0   | W1         |   |
| 0.0                   | 0.0                       | 0.0                   | 0.0 |            | 0.0   | W2         |   |
| 0.0                   | 0.0                       | 0.0                   | 0.0 |            | 0.0   | T1         |   |
| 0.0                   | 0.0                       | 0.0                   | 0.0 |            | 0.0   | Т2         | · |
| 0.0                   | 0.0                       | 0.0                   | 0.0 |            | 0.0   | 13         |   |
| 0.0                   | 0.0                       | 0.0                   | 0.0 | 0.0        | 0.0   | T4         | , |
| . 0.0                 | 0.0                       | 0.0                   | 0.0 | 0.0        | 0.0.  | T5<br>T6   |   |
| 0.0                   | 0.0                       | 0.0                   | 0.0 | 0.0        | 0.0   | T6 .<br>T7 |   |
| 0.0                   | . 0.0                     | 0.0                   | 0.0 | 0.0        | 0.0   | Τ\$        |   |
| 0.0                   | 0.0                       | 0.0                   | 0.0 | 0.0        | 0.0   | 19         |   |
| 0.0                   | 0.0                       | 0.0                   | 0.0 | 0.0        | 0.0   | то         |   |

#### ANCHOR LOADS ON ANCHOR 120, PROBLEM N3-XX-XXX, ONE SIDE ONLY

#### SECONDARY FILE INFORMATION

THERMAL /----- SCALE FACTORS -----/
LOAD UPSET FAULTED FAULTED
CASE DM-S2 CP-CT-S2

|              | TOTAL LO | OAD FROM BO | TH SIDES     | IN THE GL |      |           |             |
|--------------|----------|-------------|--------------|-----------|------|-----------|-------------|
| . FX .       | FY       | FZ          | мх           | MY        | MZ   | LOAD CASE |             |
| 0.0          | 0.0      | 0.0         | 0.0          | 0.0       | 0.0  |           | JOINT = 120 |
| 0.0          | 0.0      | 0.0         | 0.0          | 0.0       | 0.0  | CS        |             |
| 0.0          | 0.0      | 0.0         | 0.0          | 0.0       | 0.0  | CP        | •           |
| 0.0          | 0.0      | 0.0         | 0.0          | 0.0       | 0.0  | CT        |             |
| -41.3        | -11.2    | -8.4        | 28.3         | -8.9      | 20.4 | DM .      | :           |
| <b>4</b> 8.0 | 27.9     | 43.4        | 66.8         | 52.5      |      | DW        |             |
|              |          |             |              |           |      | E1        |             |
| 77.4         | 39.6     | 68.7        | <b>95.</b> 3 | 80.4      |      | E2        |             |
| 0.0          | 0.0      | 0.0         | 0.0          | 0.0       | 0.0  | ₽L        |             |
| 3.2          | 4.6      | 4.9         | 4.6          | 10.4.     | 7.9  | Si        |             |
| 6.3          | 9.3      | 9.9         | 9.2          | 20.9      | 15.7 |           |             |
| 0.0          | 0.0      | 0.0         | 0.0          | 0.0       | 0.0  | \$2       |             |
| 0.0          | 0.0      | 0.0         | 0.0          | 0.0       | 0.0  | V1        |             |
| 0.0          | 0.0      | 0.0         | 0.0          | 0.0       | 0.0  | V2        |             |
| 0.6          | 0.0      | 0.0         | 0.0          | 0.0       | 0.0  | W 1.      |             |
| -388.3       |          | -154.9      |              | ,         |      | W2        |             |
| 3.7          |          |             |              |           |      | Т1        |             |
|              |          | 2.9         | 2.1          |           |      | T2        |             |
| 0.0          | ð, Ģ     | .0.0        | 0.0          | 0.0       | 0.0  | та        |             |

| (   |     |       |     |     |     |            |
|-----|-----|-------|-----|-----|-----|------------|
| (   | 0.0 | 0.0   | 0.0 | 0.0 |     |            |
| 0.0 | 0.0 | 0.0   | 0.0 | 0.0 | 0.0 | T5         |
| 0.0 | 0.0 | 0.0   | 0.0 | 0.0 | 0.0 | T6         |
| 0.0 | 0.0 | 0.0   | 0.0 | 0.0 | 0.0 | <b>T</b> 7 |
| 0.0 | 0.0 | : 0.0 | 0.0 | 0.0 | 0.0 | 18         |
| 0.0 | 0.0 | 0.0   | 0.0 | 0.0 | 0.0 | <b>T9</b>  |
|     |     |       |     |     |     | ΤO         |

•

ANCHOR LOADS ON ANCHOR 120, PROBLEM N3-XX-XXX, ONE SIDE ONLY JOINT NAME 120

DESCRIPTION LOADS FROM SIDE 1 = TPIPE SIDE 1 RUN LOADS FROM SIDE 2 = 0 (LOADS FROM ONE SIDE ONLY)

# ANCHOR LOADS IN THE GLOBAL COORDINATE SYSTEM

|            | E CONDITION | N LOAD         | DESIG | ON LOADS    |      | DESTON | MOMENTS |     |                                   |
|------------|-------------|----------------|-------|-------------|------|--------|---------|-----|-----------------------------------|
| EQ.        |             | TYPE           | FΧ    | FY          | FZ   | MX     | MY      | MZ  |                                   |
| 8N.        | NORMAL.     | F <sup>,</sup> | 41    | 11 .        | 8    | 28     | 8       | 20  | TEUE HALVE                        |
| S:N        | NORMAL      | P              | 50    | 20          | 10   | 30     | 10      | 30  | TRUE VALUE                        |
| SN         | NORMAL      | P              | 50    | 20          | 10   | 40     | 10      | 30  | ROUNDED NEAREST 10<br>ROUNDED 10% |
| 11         | NORMAL      | P+S            | 41    | , <b>11</b> | 8    | 28     | 8       | 20  | TRUE VALUE                        |
| 11         | NORMAL      | P+S            | 50    | 20          | 10   | 30     | 10      | 30  | ROUNDED NEAREST 10                |
| 11         | NORMAL      | F+8            | 50    | 20          | 10   | 40     | 10      | 30  | ROUNDED 10%                       |
| 90         | UPSET       | P              | 89    | 39          | 51   | 95     | 61      | 90  | TRUE VALUE                        |
| 90         | UPSET       | F'             | 90    | 40          | 60   | 100    | 70      | 100 | ROUNDED NEAREST 10                |
| 90         | UPSET       | F              | 100   | 50          | 60   | 110    | 70      | 100 | ROUNDED 10%                       |
|            | UPSET       | P+S            | 89    | 39          | 51   | 95     | 61      | 90  | TRUE VALUE                        |
|            | UPSET       | P+S            | 90    | 40          | 60   | 100    | 70      | 100 | ROUNDED NEAREST 10                |
|            | UPSET       | P+S            | 100   | 50          | 60   | 110    | 70      | 100 | ROUNDED 10%                       |
| 9 <b>F</b> | FAULTED     | F              | 118   | 50          | 77   | 123    | 89      | 118 | TRUE VALUE                        |
| PΕ         | FAULTED     | F)             | 120   | 60          | 80   | 130    | 90      | 120 | ROUNDED NEAREST 10                |
| 9F         | FAULTED     | F'             | 140   | 80          | 90   | 140    | 100     | 130 | ROUNDED 10%                       |
|            | FAULTED     | P+S            | 118   | 50          | . 77 | 123    | 89      | 118 | TRUE VALUE                        |
|            | FAULTED     | P+S            | 120   | 60          | 80   | . 130  | 90      | 120 | ROUNDED NEAREST 10                |
|            | FAULTED     | F+8            | 140   | 60          | 90   | 140    | 100     | 130 | ROUNDED 10%                       |

# ANCHOR LOADS IN THE LOCAL COORDINATE SYSTEM

| CODE CONDITION LOAD |         | N LOAD         | DESIG | ON LOADS |          | DESIGN | MOMENTS |           |                    |
|---------------------|---------|----------------|-------|----------|----------|--------|---------|-----------|--------------------|
| EQ.                 |         | TYPE           | FΧ    | FY       | FZ       | MX     | MY      | MZ        |                    |
| SN                  | NORMAL  | P              | . 8   | 11       | 41       | 20     | 8       | -         |                    |
| 8N                  | NORMAL  | F              | 10    | 20       | 50       |        | _       | 28        | TRUE VALUE         |
| ⊜N                  | NORMAL  | F              | 10    | 20       | 50<br>50 | 20     | 10      | 30        | ROUNDED NEAREST 10 |
|                     | . —     |                | • •   | 2.9      | 30       | 30     | - 10    | 40        | ROUNDED 10%        |
| 1 1                 | NORMAL  | P+S            | 8     | 1 1      | 41       | 20     | 8       | 20        | T-01.00            |
| 11                  | NORMAL  | P+S            | 10    | 20       | 50       | 20     |         | 28        | TRUE VALUE         |
| 1.1                 | NORMAL  | P+S            | 10    | 20       |          |        | 10      | 30        | ROUNDED NEAREST 10 |
|                     |         |                | 10    | 20       | 50       | 30     | 10      | 40        | ROUNDED 10%        |
| 90                  | UPSET   | F              | 51    | 39       | 89       | 90     | 61      | 0.5       |                    |
| 90                  | UPSET   | ۴۰             | 60    | 40       | - 90     | 90     |         | 95<br>*** | TRUE VALUE         |
| 90                  | UPSET   | P              | 60    | 50       |          |        | 70      | 100       | ROUNDED NEAREST 10 |
|                     |         | •              | 603   | 30       | 100      | 100    | 70      | 110       | ROUNDED 10%        |
|                     | UPSET   | P+S            | 51    | 39       | 89       | 90     |         | o=        | T-5.15             |
|                     | UPSET   | P+S            | 60    | 40       | 90<br>90 | · -    | 61      | 95        | TRUE VALUE         |
|                     | UPSET   | P+S            | 60    | 50       |          | 90     | 70      | 100       | ROUNDED NEAREST 10 |
|                     |         |                |       | 20       | 100      | 100    | 70      | 110       | ROUNDED 10%        |
| 9F                  | FAULTED | F              | . 77  | 50       | 118      | 118    | 89      | 4.50      | TEME               |
| 9F                  | FAULTED | P              | 80    | 50       | 120      | 120    |         | 123       | TRUE VALUE         |
| 9F                  | FAULTED | P <sup>c</sup> | 90    | 60       | 130      |        | 90      | 130       | ROUNDED NEAREST 10 |
|                     |         |                |       | 00       | 130      | 130    | 100 .   | 140       | ROUNDED 10%        |
|                     | FAULTED | P+S            | 77    | 50       | 118      | 118    | 89      | 100       | TOUR LINE LIE      |
|                     | FAULTED | - P+S          | 80    | 50       | 120      |        |         | 123       | TRUE VALUE         |
|                     | FAULTED | P+S            | 90    | 60       |          | 120    | 90      | 130       | ROUNDED NEAREST 10 |
|                     |         |                | 70    | 60       | 130      | 130    | 100     | 140       | ROUNDED 10%        |

# NOTE 1-- LOCAL COORDINATE SYSTEM DEFINITION

LOCAL X: DIRECTED FROM ANCHOR TO NODE POINT CO1

LOCAL Y: FOLLOWS RIGHT-HAND RULE. (SEE LOCAL Z. Y=Z CROSS X)

LOCAL Z: IN HORIZONTAL PLANE, FOLLOWS RIGHT-HAND RULE.

CROSS LOCAL X INTO \*\*\*GLOBAL\*\*\* Y.

NOTE 2- P= PRIMARY, S= SECONDARY

LOADS IN POUNDS, MOMENTS IN FOOT POUNDS

ANCHOR LOADS ON ANCHOR 120, PROBLEM N3-XX-XXX, ONE SIDE ONLY

JOINT NAME 120

DESCRIPTION LOADS FROM SIDE 1 = TPIPE SIDE 1 RUN LOADS FROM SIDE 2 = 0 (LOADS FROM ONE SIDE ONLY)

#### ANCHOR LOADS IN THE GLOBAL COORDINATE SYSTEM

| CODE | CONDITION | N LOAD | DESIG | N LOADS |    | DESIGN | MOMENTS |     |
|------|-----------|--------|-------|---------|----|--------|---------|-----|
| EQ.  |           | TYPE   | FX    | FY      | ۴Z | MX     | MY      | MZ  |
| ≅N.  | NORMAL    | P      | 50.   | 20      | 10 | 30     | 10      | 30  |
| 11   | NORMAL    | P+S    | 50    | 20      | 10 | 30     | io      | 30  |
| 90   | UPSET     | P      | 90    | 40      | 60 | 100    | 70      | 100 |
|      | UPSET     | P+8    | 90    | 40      | 60 | 100    | 70      | 100 |
| 9F   | FAULTED   | . P    | 120   | 60      | 80 | 130    | 90      | 120 |
|      | FAULTED   | P+S    | 120   | 60      | 80 | 130    | 90      | 120 |

#### ANCHOR LOADS IN THE LOCAL COORDINATE SYSTEM

| CORE | CONDITION | V LOAD | DESIG | N LOADS | -   | DESIGN | MOMENTS |      |
|------|-----------|--------|-------|---------|-----|--------|---------|------|
| EQ.  |           | TYPE   | F¨Χ   | FΥ      | F Z | MX     | MY      | MZ   |
| ≅N   | NORMAL    | P      | 10    | 20      | 50  | 20     | 10      | 30   |
| 1 1  | NORMAL    | , P+8  | 10    | 20      | 50  | 20     | 10      | 30   |
| 9U   | UPSET     | P      | 60    | 40      | 90  | 90     | 70      | 100  |
|      | UPSET     | P+S    | - 60  | 40      | 90  | 90     | 70      | 100  |
| 9F   | FAULTED   | F.     | 80    | 50      | 120 | 120    | 90      | 1:30 |
|      | FAULTED   | P+8    | 80    | 50      | 120 | 120    | 90      | 130  |

#### NOTE 1-- LOCAL COORDINATE SYSTEM DEFINITION

LOCAL X: DIRECTED FROM ANCHOR TO NODE POINT COI

LOCAL Y: FOLLOWS RIGHT-HAND RULE. (SEE LOCAL Z. Y=Z CROSS X)

LOCAL Z: IN HORIZONTAL PLANE, FOLLOWS RIGHT-HAND RULE.

CROSS LOCAL X INTO \*\*\*GLOBAL\*\*\* Y.

NOTE 2-- P= FRIMARY, S= SECONDARY

LOADS IN POUNDS, MOMENTS IN FOOT FOUNDS

#### DIVISION OF ENGINEERING DESIGN NONCONFORMANCE REPORT

MEDS Accession No

CEB 83 06 08 009

|                                                                                                                                                                                                                                                                                                                                                                                  | [1] REPORT NO. GENCESS 302 B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 PLANT REN CON LIEU PLAN                                                                                                                                                                                                                                                                                                                                                        | [3] vmr Al1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| BEN, SQN, WEN, BLN                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| FREPARER/ORGANIZATION/DATE D. W. Hargroves/EN                                                                                                                                                                                                                                                                                                                                    | DES-CEB/3-24-83                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| See Attachment l for description                                                                                                                                                                                                                                                                                                                                                 | 840803F0055 <b>3</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 6 DATE OF OCCURRENCE EST ( x), ACT. ( ) 1976                                                                                                                                                                                                                                                                                                                                     | 9 SIGNIFICANT CONDITION ADVERSE TO QUALITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 7 METHOD OF DISCOVERY                                                                                                                                                                                                                                                                                                                                                            | YES NO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 8 UNID CODE (EN DES EP 8.01)                                                                                                                                                                                                                                                                                                                                                     | 10 BRANCH CHIEF/DATE LONG FRANK LEVE 6/9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| directly usable local and global loa system. The user's manual is being These modifications to the program recomputing these coordinate transform confusion regarding these conversion the global and program-defined local anchor designer to perform further of Reanalyze all problems which were an ANCHOR for all affected plants using the previous design loads and redest | ion cosines based on more easily output has been modified to provide more did rather than loads in the record modified to reflect these changes.  Telieve the analyst of the task of mations by hand, thus alleviating the mations by hand, thus alleviating the mations alleviating the mations, alleviating the need for the coordinate conversions.  The output is similarly reported in all systems, alleviating the need for the coordinate conversions.  The output is similarly reported in all systems, alleviating the need for the coordinate conversions.  The output is similarly reported in all systems, alleviating the need for the coordinate conversions. |
| See Attachment 2 for plant specific  CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQU                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| DESIGN CRITERIA DOCUMENT NO                                                                                                                                                                                                                                                                                                                                                      | EXCEPTION HEQUEST NO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| FON RECHIRED TYES NOT TOWNER                                                                                                                                                                                                                                                                                                                                                     | [15] SCHEDULE IMPACT TO A TIN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

### NONCOMPORMANCE REPORT CENCESS 302 RI (I) NEFORT NO. 46 ASSIGNABLE CAUSE IREQUIRED IF SIGNIFICANTS Incorrect data specifications contained in the user's manual. Subsequent misuse of program. Misinterpretation of output. 17 THIS IS A GENERIC CONDITION YES [ IS ACTION REQUIRED TO PREVENT RECURRENCE (REQUIRED IF SIGNIFICANT) Version 2.0 of the ANCHOR program will be used exclusively in the future to prevent recurrence of this problem. 'INDEPENDENT REVIEW 20 LABOR EST. ( ), ACT. ( ) SCHEDULE EST ( ), ACT ( ) ACTIVITY NO. 23 TASK DESCRIPTION 24 DATE INITIATED Revision 1 is issued to clarify description of condition. It has been determined that these anomalies do not affect BLN because no skewed anchors were designed which use this particular direction cosine option in question nor do they affect BFN becuase the ANCHOR program has not been used to date. This NCR is superseded by GENCEB8402, MEDS accession number CEB 840312 003. 27 DISTRIBUTION 26 ALL EN DES ACTION COMPLETE CONST PROJECT MANAGER EN DES PROJECT MANAGER CHIEF, ESB CHIEF, ESB OFFICE OF QA NEB 1 the Significant NCRs)\* MED 5 CIS NSRS 1 tor Significant NCRs)\* ASSISTANT TO THE MANAGER OF DEDC (Quality and Nuclear Safety)—for Significant NCRs DISTRIBUTE AFTER THIS SIGNATURE HANDCARRY COPY TO MEB-NLS RO-Barnette 84 07 17

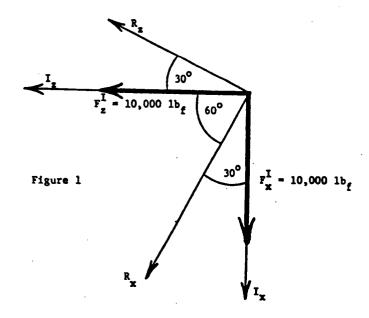
MEDS ACCESSION NO.

#### NCR GENCEB8302 RI Attachment 1

#### Description of Condition:

Discrepancies have been found in the input specifications for the direction cosines option of the ANCHOR program. The output could also have been misinterpreted in the wrong coordinate system. This option only affects anchors that are skewed relative to the plant global coordinate system.

The purpose of the anchor load program is to combine the loads from both sides of an anchor, compare these loads to allowables, and provide total loads on the anchor. These loads on each side of the anchor are generally determined by a separate stress analysis computer program. If the loads on each side of the anchor are in different coordinate systems, the direction cosines option of the ANCHOR program must be employed to convert these loads to a consistent coordinate system. This system is referred to as the record coordinate system in ANCHOR. Page III-4 of the ANCHOR program defines these direction cosines from the input system (the system used to define loads in the stress analysis program) to the record system. These input specifications are in error. To be correct, they should define the direction cosines from the record system to the input system.



This subtle difference can best be illustrated with an example. Consider a 10,000  $1b_{\hat{f}}$  load in the x and z directions of the input (I) system as shown in figure 1. If the record (R) system is skewed  $30^{\circ}$  from the input system as shown (common  $Y_{\hat{I}} = Y_{\hat{R}}$  up out of page), it can be shown that these loads resolve into the record system as:

$$F_{x}^{R} = 13,600, F_{z}^{R} = 3,660$$

The ANCHOR manual describes the system relations, relative angles, and direction cosines as:

When input to ANCHOR, it will resolve loads of:

$$F_{x}^{R} = 3,660 \text{ and } F_{z}^{R} = 13,660 ,$$

which are in error. When correctly defined as:

the ANCHOR program will correctly resolve the loads. Since the resultant loads are reported in the record system and must be resolved into global and local loads by similar direction cosines, the anchor load designer could similarly misinterpret the results.

#### NCR GENCEB8302 R1 Attachment 2

#### Corrective Action

BLW units 1 and 2:

No corrective action required -- see remarks.

BFN units 1, 2, and 3: No corrective action required since ANCHOR program has not been used to date.

WBM unit 1:

Anchors have been redesigned per ANCHOR program, version 2.0. Supports have been redesigned and installed.

DIVISION OF ENGINEERING DESIGN VEORMANCE REPORT CEB'840312 003 CENCEB8402 1 REPORT NO. PLANT BEN, SQN, WBN, BLN PREPARER/ORGANIZATION/DATE ing EN DES-CEB/ 3-7-84 DESCRIPTION OF CONDITION ression 2.0 of the ANCHOR program for Errors have been found in us : determining the design loads to ping anchors. The outputs of the global loads from the program are consistive. However, the results of the transformation from global coord: . . system to local coordinate system for who sed anchors (that is, anchor was se local axes are not parallel to one of the global directions) are inservative. It is mainly due to the use of absolute values of the glob , loads. Reversing global loads have not been considered in the process of predinate system transformation. 840604**B**00**76** DATE OF OCCURRENCE EST (X), ACT 1 1 135 Mee Descript on o Condition (Block ) By Thore Of Minet 3 UNIQ CODE (EN DES-EP 8.01) TIM CORRECTIVE ACTION -Correct errors in very section to the ANCHOR Communication Notifies Diping analysis groups of the condition these errors Apples and the first methor load -Request a review of issued and elsage and for food to determined to be unco ervative -Modify any deficient chor sup; rt lesigns. SCHEDULED DATE OF COMPLETION Completed MO X CORRECTIVE ACTION DEVIATES FROM A DESIG - SITERIA REQUIREMENT YES DESIGN CHITEHIA DOCUMENT NO. EXCEPTION REQUEST NO.

NO ECN NO.3892 (WBN)

ECN REQUIRED

X YES

15 SCHEDULE IMPACT P A X N

|          |                                                                                                                                                                        |                                             | <u> </u>                                                                                               |                                                          |                    |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------|--------------------|
|          | •                                                                                                                                                                      | NONCOM                                      | FORMANCE REPORT                                                                                        | 1 REPORT NO. CE                                          | NCEB8402           |
| 16       | ASSIGNABLE CAUSE (REQUIRED IF S                                                                                                                                        | IGNIFICANT)                                 |                                                                                                        |                                                          |                    |
|          | Unconservative transform was introduced in the ve definition of computer p                                                                                             | rsion 2 of                                  | the ANCHOR & program,                                                                                  | due to inadequat                                         | e :e               |
| 17       | POTENTIAL GENERIC CONDITION REV                                                                                                                                        | TIEW REQUIRED I                             | en des-ep 152) YES X NO                                                                                | <b>⊳</b> □                                               |                    |
| 180      | ACTION REQUIRED TO PREVENT RECU                                                                                                                                        |                                             |                                                                                                        |                                                          |                    |
|          | -Revise version 2 ANCHOR                                                                                                                                               | program                                     |                                                                                                        |                                                          |                    |
| 186      | <ul> <li>Revise and update prog<br/>benchmark problems. A<br/>devised for TVA's comp<br/>development (CEB 83092<br/>documentation requirem<br/>and updates.</li> </ul> | ram documen plan for puter aided 0 003). Th | <pre>iping analysis program   ping analysis and so    plan which requires ng implemented for all</pre> | n documentation<br>upport design pro<br>s extensive prog | is<br>ogram<br>ram |
| 19       | *INDEPENDENT REVIEW 201                                                                                                                                                | 2                                           | 14-54 mokes                                                                                            | all                                                      | £ 5/21/84          |
| 20       | LABOR EST ( ), ACT ( )                                                                                                                                                 | МН                                          | 21 SCHEDULE EST. ( -), ACT. (                                                                          |                                                          | DAYS               |
| 22       | ACTIVITY NO.                                                                                                                                                           | 23 TASK DESC                                | CRIPTION                                                                                               | 24 DATE INITIATED                                        |                    |
| 25       | REMARKS                                                                                                                                                                | <b>.</b>                                    |                                                                                                        |                                                          |                    |
|          | -This NCR supersedes NCF                                                                                                                                               | R GENCEB8302                                | 2 R1.                                                                                                  |                                                          |                    |
| 27<br>28 | DISTRIBUTION: CONST PROJECT MANAGER EN DES PROJECT MANAGER CHIEF ESR                                                                                                   |                                             | 28 ALL EN DES ACTION CO                                                                                | DMPLETE:                                                 | 5/25/81            |

CHIEF, ESB OFFICE OF QA

MEDS CIS

EN DES MANAGER (for significant NCRs) NEB (for Significant NCRs)\*\* NSRS (for Significant NCRs)

\*DISTRIBUTE AFTER THIS SIGNATURE \*\* HANDCARRY COPY TO NEB NLS

\*BRANCH CHIEF/ORG .

'84 0525 MEDS ACCESSION NO. CEB

EN DES-EP 1.26 Attachment No. 3 Page 1 of 1

## EN DES NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

NCR NO. GENCEB 8402

SIGNIFICANT YES NO D REPORTABLE YES NO D

Verified By Denny C Hung Date 5/11/84

- A. Have any analyses, contracts, memorandums, etc., requiring EN DES work been generated? Yes O No X If yes, list in (C) below.
- B. Have all ECNs related to the NCR been issued?

  N/A U Yes No U I yes, list in (C) below.
- C. Documents related to the NCR (ECN, analyses, memos, contract No., etc.)

|    |                                                                                                         | REF OR MEDS 'ACCESS. NO. |             | COMPLETION DATE |
|----|---------------------------------------------------------------------------------------------------------|--------------------------|-------------|-----------------|
|    | ECN 3882                                                                                                | WBP8405105               | 24          | 5/10/84         |
|    |                                                                                                         |                          |             |                 |
|    |                                                                                                         |                          |             |                 |
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|    |                                                                                                         |                          |             |                 |
|    |                                                                                                         |                          | <del></del> |                 |
|    |                                                                                                         |                          |             |                 |
| D. | Is action by organization outside EN Organization tracking No.                                          |                          |             | No X            |
| E. | Has all necessary EN DES information outside EN DES to enable the complet Yes □ No □ N/A O If yes, list | cion of work req         |             | organization    |
| F. | Is all EN DES action complete? Yes                                                                      | X No 🗆                   |             |                 |
| G. | Remarks:                                                                                                | io-                      |             |                 |

Page \_\_\_\_\_ of \_\_\_\_\_

#### **EVALUATION SHEET**

Rev.  $\frac{R2}{11/18/83}$ 

. Task Force Category 7 for Watts Bar Nuclear Plant - Unit 1

2. Task Force Category Description and Related B&V Findings:
Nonconforming conditions in construction of previously inspected and accepted pipe supports: F367, F704, F718, F719, F726, F734, F736, F737, F749, F772, F773, F774, F776, F819, F884, F919, and F920.

#### 3. Evaluation for Cause

- A. Preliminary
  - -On ones involving parts removed after final inspection cause unknown.
  - -On ones involving missing welds and members different than drawing oversight.
  - -On ones involving clearance and out of tolerance cause unknown.
- B. Final
  - -On ones involving parts removed after final inspection cause unknown.
  - -On ones involving missing welds and members different than drawing oversight.
  - -On ones involving clearance and out of tolerance Concur w/A except clearance and out of tolerance problems are usually oversights/additional unknown causes

Resp. Org. Paras Prom. 4/18/83 Task Force Concurrence 1/20/83

- 4. Evaluation for Generic Examples
  - A. Preliminary

It is assumed that these examples exist through all systems.

B. Final

These examples exist through all systems with one generic exception. Bergen-Paterson (B-P) drawing 6000-l authorizes the deletion of internal pipe side welds for box frames comprised of WF members only. The misapplication of this exemption is generic for only B-P drawings and not for TVA or EN DES drawings.

Resp. Org Mauch Romi 4/18/83 Task Force Concurrence 2/2/83

- 5. Licensing Basis Satisfaction
  A. Preliminary
  - Nine of the 17 hangers did not satisfy the licensing basis.
  - B. Final

Based on the premise that "use-as-is" disposition of NCRs will satisfy licensing basis, ten of the seventeen hangers will not satisfy it.

Resp. Org Hermon Glown 4/18/83 Task Force Concurrence 2/2 4 Kol 83

- 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work
  - A. Preliminary

Corrective action is 79-14 program Phase I as defined by WBN-QCP-4.56. Corrective action is adequate.

B. Final
Concur with 6.A.

Resp. Org Voucol. Man 4/18/83 Task Force Concurrence Iff 4/20/83

- 7A. Identification of Corrective Action for Completed Work
  - A. Preliminary

The plan in 6AA is adequate.

B. Final Concur.

Resp. Org House R. Poete 4/18/83 Task Force Concurrence 2/2-183

| 8A.  | Imp | lementation and Inspection of Corrective Action for Completed Work                                                                                                                       |
|------|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | A.  | Preliminary                                                                                                                                                                              |
|      |     | The implementation of NRC Bulletin OIE 79-14 is required prior to unit fuel loading. This requirement will ensure implementation and inspection of corrective action for completed work. |
| _    | в.  | Final                                                                                                                                                                                    |
|      |     | Concur.                                                                                                                                                                                  |
|      | Res | p. Org. Thomas R Blown H/18/83 By Rom  By Rom  1/18/83                                                                                                                                   |
| 9A.  | Ide | ntification and Evaluation of Ongoing Corrective Action for Future Work                                                                                                                  |
|      | A.  | Preliminary                                                                                                                                                                              |
|      |     | It is acceptable for TVA to continue with the program in place and to follow up with the 79-14 program.                                                                                  |
|      | в.  | Final                                                                                                                                                                                    |
|      |     | Concur with 9.A. In addition we have corrected the misinterpretation of pipe side welds on B-P drawing through additional training of inspectors.                                        |
|      | Res | p. Ors House P. Polon, 4/19/43 Task Force Concurrence Defended 83                                                                                                                        |
| 10A. | Ide | ntification of Corrective Action for Future Work                                                                                                                                         |
|      | A.  | Preliminary                                                                                                                                                                              |
|      |     | Same comment as 9AA above.                                                                                                                                                               |
| •    |     |                                                                                                                                                                                          |
|      |     |                                                                                                                                                                                          |

Resp. Org Mount Hound/19 13 Task Force Concurrence

B. Final

Same as 9A.B.

| Α.                  | rrelimina                                           | , <b>-</b> J                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                      |                                                     |                                              |                                           |                              |                             |            |
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| _                   |                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                      |                                                     |                                              |                                           |                              |                             |            |
| В.                  | Final                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                      |                                                     | •                                            |                                           |                              |                             |            |
| •                   | Concur.                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                      |                                                     |                                              |                                           |                              |                             |            |
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| Res                 | p. Org. <u>~</u>                                    | homas RR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                      | 원왕<br>_ Task Force                                  | e Concurrer                                  | ice P                                     | home                         | 11/8/8                      | 3          |
| A. Ver              | ification                                           | of Effecti                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | veness of (                                          | Corrective A                                        | ction for l                                  | Future Work                               |                              |                             |            |
| A.                  | Prelimina                                           | ıry                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                      | -                                                   |                                              |                                           |                              |                             |            |
|                     | Tmplement                                           | ration of D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | haca TT of                                           | the 79-14 p                                         |                                              | l warifu th                               |                              |                             |            |
|                     | final des                                           | sign and ac                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ceptance of                                          | the hanger                                          | S.                                           | r verity the                              | =                            |                             |            |
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| . <b>R</b>          | Final                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                      |                                                     |                                              |                                           |                              |                             |            |
| В.                  | Final                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                      |                                                     |                                              |                                           |                              |                             |            |
| В.                  | Concur.                                             | Audits by                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | other gorup                                          | s will stre                                         | ngthen this                                  | s program al                              | l <del>so.</del>             |                             |            |
| 4/                  | Concur. No furthe                                   | er action r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <del>equired on</del><br>ne basis fo                 | this Black<br>r OMS closum                          | & Veatch ex                                  | tegory. To                                | nis<br>aluation              | n sheet                     | is<br>data |
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| Res<br>B. Ide       | Concur. No further is noted in November p. Org.     | er action relosed. The J. W. von W. 8, 1984 (Q. Puolok. Meru                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | required on the basis for Weisenstein MS 841108 2    | r QMS closur<br>'s memorandu<br>01)<br>Task Forc    | & Veatch extended for this continue to Quali | category ev<br>category ev<br>ty Manageme | raluation<br>ont Staff       | Files<br>2/ <i>3/</i> /8/   | date<br>   |
| Res<br>B. Ide       | Concur. No further is noted in November p. Org.     | er action relosed. The J. W. von W. 8, 1984 (Q. Puolok. Meru                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | required on the basis for Weisenstein MS 841108 2    | r QMS closur<br>'s memorandu<br>01)<br>Task Forc    | & Veatch extended for this continue to Quali | category ev<br>category ev<br>ty Manageme | raluation<br>ont Staff       | Files<br>2/ <i>3/</i> /8/   | date<br>   |
| Res<br>B. Ide       | Concur. No further is noted in November p. Org.     | er action relosed. The J. W. von W. 8, 1984 (Q. Puolok. Meru                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | required on the basis for Weisenstein MS 841108 2    | r QMS closur<br>'s memorandu<br>01)<br>Task Forc    | & Veatch extended for this continue to Quali | category ev<br>category ev<br>ty Manageme | raluation<br>ont Staff       | Files<br>2/ <i>3/</i> /8/   | date       |

11A. Implementation of Corrective Action for Future Work

|     | Α.  | Preliminary      |                  |             |                |             | /    |              |
|-----|-----|------------------|------------------|-------------|----------------|-------------|------|--------------|
|     |     | N/A              |                  |             |                |             |      |              |
|     |     |                  |                  | ·           |                |             |      |              |
|     | В.  | Final            |                  |             |                |             |      |              |
|     |     |                  |                  |             |                |             |      |              |
|     | -   |                  |                  |             |                |             |      |              |
|     | Res | sp. Org.         |                  | Task Force  | e Concurrence  |             |      |              |
| 8B. | Imp | olementation and | Inspection of Co | orrective A | ction for Comp | leted Work  |      |              |
|     | Α.  | Preliminary      |                  |             |                |             |      |              |
|     |     | N/A              |                  |             |                |             |      |              |
|     |     |                  |                  |             |                |             |      | <del>.</del> |
|     | В.  | Final            |                  |             |                |             | •    |              |
|     |     |                  |                  |             |                |             |      |              |
|     |     |                  |                  |             |                |             |      |              |
|     | Res | sp. Org.         |                  | Task Forc   | e Concurrence  |             |      |              |
| 9в. | Ide | entification and | Evaluation of O  | ngoing Corr | ective Action  | for Future  | Work |              |
|     | Α.  | Preliminary      |                  |             |                |             |      |              |
|     |     | N/A              |                  |             |                |             |      |              |
|     |     |                  |                  |             |                |             |      |              |
|     | в.  | Final            |                  |             |                |             |      |              |
|     |     |                  |                  |             |                |             | ·    |              |
|     |     |                  |                  |             |                |             |      |              |
|     | Re  | sp. Org.         | 1 1              | Task Forc   | e Concurrence  |             |      |              |
|     |     |                  |                  |             |                | <del></del> |      |              |

7B. Identification of Corrective Action for Completed Work

| A.     | Preliminary    |                     |                                       |     |
|--------|----------------|---------------------|---------------------------------------|-----|
|        | N/A            |                     |                                       |     |
|        |                |                     |                                       |     |
| В      | Final          |                     |                                       |     |
|        |                |                     |                                       |     |
|        |                |                     |                                       |     |
|        |                |                     |                                       |     |
| Re     | esp. Org.      |                     | Task Force Concurrence                |     |
| lB. In | plementation o | f Corrective Action | n for Future Work                     |     |
|        | . Preliminary  |                     |                                       |     |
|        | N/A            |                     |                                       |     |
|        |                |                     |                                       |     |
|        |                |                     |                                       | ž   |
| В      | . Final        |                     |                                       |     |
|        |                |                     |                                       |     |
|        |                |                     |                                       |     |
| Re     | esp. Org.      |                     | Task Force Concurrence                |     |
| 2B. V  | erification of | Effectiveness of C  | orrective Action for Future Work      |     |
|        | • Preliminary  | •                   |                                       | •   |
|        | N/A            | •                   | · · · · · · · · · · · · · · · · · · · |     |
|        | ·              |                     |                                       |     |
|        |                |                     | •                                     |     |
| В      | • Final        |                     |                                       |     |
|        | · .            |                     |                                       |     |
|        |                |                     |                                       |     |
| R      | esp. Org.      |                     | Task Force Concurrence                | / / |
|        |                |                     |                                       |     |

10B. Identification of Corrective Action for Future Work

.United States Government Memorandum

841113T0600 TENNESSEE VALLEY AUTHORITY OMS '841108 201

Quality Management Staff Files

J. W. von Weisenstein, 384 SPB-K

DATE

NOV 8 1984

SUBJECT:

ASSESSMENT OF ADEQUACY OF CORRECTIVE ACTION FOR FUTURE WORK FOR BLACK AND

VEATCH TASK FORCE CATEGORY 7

For this category, the TVA task force for review of Black and Veatch findings determined that the condition was applicable to Watts Bar units 1 and 2 and that corrective action was required for completed and future work. QMS performed a surveillance in accordance with the attached scoping document to assess the adequacy of corrective action implementation for completed and future work, as well as the effectiveness of corrective action for future work. The results of that surveillance, contained in the attached surveillance report, verified the adequacy of the work-accomplished.

However, a concern was identified in the attached report which does not impact the closure of this item but does require action by OE. The NCR WBNSWP8307 form did not contain all the required information as required by EPs 1.26 and 2.02 prior to submittal of the unit 1 final 50.55(e) report to the NRC. The corrective action and action to prevent recurrence sections of this NCR form remain incomplete at this time. The corrective action and action to prevent recurrence sections of the NCR should be completed as soon as possible.

Based upon our assessment of category 7, we conclude that this category can be closed by signing and dating item 12A, "Verification of Effectiveness of Corrective Action for Future Work."

JvW: MBP

Attachments

E. G. Beasley, W12C61 C-K (Attachments)

L. E. Brock, 396 SPB-K

J. S. Colley, 374 SPB-K (Attachments) H. L. Jones, W10D224 C-K

Principally Prepared By: J. W. von Weisenstein (1706)

11/8/84 - EGB: MBP cc (Attachments).

R. W. Cantrell, W11A9 C-K

MEDS, W5B61 C.K J. C. Standifer, P-104 SB-K - Note closure of this B&V category is based on NCR WBNSWP8307 and your completion of 02180 the NCR form.

D. B. Bowen, WllA8 C-K

--EGB

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

QUALITY MANAGEMENT STAFF SURVEILLANCE REPORT FOR THE ASSESSMENT OF THE EFFECTIVENESS OF CORRECTIVE ACTIONS IDENTIFIED IN THE TASK FORCE REPORT ON THE BLACK AND VEATCH FINDINGS

PLANT: Watts Bar Nuclear Unit CATEGORY:

Approved By:

Concerns: NO / / Yes /X / (if yes, identify below)

Results:

#### Management Summary:

The design processes evaluated are outlined in the attached surveillance scoping document and were determined to be in full compliance with requirements with the following exception:

NCR WBNSWP8307 form did not contain all the required information as required by EPs 1.26 and 2.02 prior to submittal of the unit 1 final 50.55(e) report to NRC. The "corrective action" and "action to prevent recurrence" sections of this NCR form remain incomplete at this time. Also, final response to IE Bulletin 79-14 was delayed for six months before submittal. There appears to be no problem with delay in 79 14 response; however, NCR WBNSWP8307 form should be completed as soon as possible.

#### Conclusions and Recommendations:

Based upon the results of this surveillance, the corrective action implemented for both the completed and future work is adequate, and the effectiveness of corrective action for future work was also adequate. However, even though NCR WBNSWP8307 corrective action has been identified in the unit 1 final 50.55(e) report to NRC, the NCR form remains incomplete; therefore, it is recommended that "corrective action" and "action to prevent recurrence" sections be completed as soon as possible.

#### III. Details:

- A. Performed the following surveillance activities to verify corrective action implementation for completed work:
  - Verify that the deficiencies identified in the Black and Veatch findings have either been corrected or are being tracked.

Results: Interviewed several OE personnel at the Watts Bar site by telephone including: Henry Jones, Tom Brown, Charles Hustler, and Robert McKay about the Black and Veatch findings. Also, James Worthy of OE-MEB-MLS was interviewed about the EM DES MCR. Reviewed the 17 deficiencies listed in the Black and Veatch evaluation sheet for task force category 7 for Watts Bar units 1 and 2. These 17 findings were translated into seven COMST MCRs and one EM DES MCR. These NCRs have been closed out with the exception of one CONST MCR and the EN DES MCR.

Disposition for NCR 4486R has been completed, but NCR has not been closed out.  $\begin{tabular}{ll} \hline \end{tabular}$ 

A final 50.55(e) report has been issued to NRC on the unit 1 part of NCR WBNSWP8307; however, the "corrective action" and "action to prevent recurrence" sections of NCR form have not been completed. This is contrary to requirements of EN DES-EPs 1.26 and 2.02 which indicate that those sections of the form must be completed before the final report is submitted.

2. Verify completed work by sampling.

Results: Reviewed the following NCRs which relate to the designated Black and Veatch findings:

NCR 4454R R1 = F734, F737, F749, F773, and F774

NCR 4455R = F704, F718, F726, F736, F772, and F776

NCR 4478R = F884

NCR 4480R R1 = F919

NCR 4481R R1 = F920

NCR 4486R = F819 (not closed out)

NCR 4535R = F719

NCR WBNSWP8307 = F367 (final 50.55(e) report for unit 1 has been issued; however, appropriate sections of the NCR form have not been completed)

Six were closed and two still open but being tracked.

B. Performed the following surveillance activities to verify corrective action implementation for future work:

Verify inspector training on Bergen-Paterson drawing inspection:

Results: Corrective action on the unit 1 final 50.55(e) report for NCR WBMSWP8307 indicated that Hanger Engineering and Quality Control Units were to receive additional training emphasizing implementation of drawing requirements. Interviewed Robert HcKay of Watts Bar site by phone who indicated that this training had been accomplished but that it would be an ongoing task, especially for new personnel. No records were reviewed at this time.

- C. Performed the following surveillance activities to assess the effectiveness of corrective action for future work:
  - 1. Evaluate the current status of the IE Bulletin 79-14 program:

Results: Interviewed James Ritts, Loretta Cecilia, and William Kagay about response to NRC for Watts Bar portion of IE Bulletin 79-14. William Kagay of CEB indicated that CEB report, "Inspection Summary Report 79-14 Phase II," revision 1, was submitted to NEB-NLS in April 1984. CEB considered this a final response. NEB-NLS felt report was too disjointed and put it on hold. Loretta Cecilia of NEB-NLS reviewed report and submitted response to L. M. Mills during week of October 22, 1984.

 Assess the effectiveness of the IB Bulletin 79-14 program and evaluate this category for closure based upon control by 79-14 or some other rationale.

Results: The IE Bulletin 79-14 program appears to be effective despite inadvertent delay in submitting final response to NRC for Watts Bar portion. NEB-NLS indicated a program for Bellefonte would be devised. The concerns of IE Bulletin 79-14 for Watts Bar have been resolved and the two NCRs relating to Black and Veatch findings, which are not yet closed, are being tracked; therefore, this category can be closed.

#### IV. Documents Reviewed:

NRC IE Bulletin 79-14 NCR WBNSWP8307 (SWP 830111 036) NCR 4454R R1 (WBN 830122 141) MCR 4455R (WBM 821126 135)
MCR 4478R (WBM 821102 152)
MCR 4480R R1 (WBM 830525 110)
MCR 4481R R1 (WBM 830525 111)
MCR 4486R (WBM 821207 101)
MCR 4535R (WBM 830104 130)
EN DES-EP 1.26 (ESB 840628 204)
EN DES-SEP 82-25 R1 (NEB 830818 852)
EN DES-EP 2.02 (ESB 831005 207)

#### V. <u>List of Personnel Contacted:</u>

| <u>Name</u>     | TitleOr                                | rganization |  |
|-----------------|----------------------------------------|-------------|--|
| Tom Brown       | Asst. CONST Engineer (Civil & Hangers) | <b>W</b> BP |  |
| Charles Hustler | Civil Engineer                         | WBP         |  |
| Henry Jones     | Head, Operations Support Group         | WBP         |  |
| Robert McKay    | Project Engineer                       | WBP         |  |
| James Worthy    | Nuclear Engineer                       | NEB-NLS     |  |
| James Ritts     | Nuclear Engineer                       | NEB-NLS     |  |
| Loretta Cecilia | Civil Engineer                         | NEB-NLS     |  |
| William Kagay   | Civil Engineer                         | CEB         |  |

#### VI. Scoping Document (Attached)

QUALITY MANAGEMENT STAFF SCOPING DOCUMENT FOR THE ASSESSMENT OF THE EFFECTIVENESS OF CORRECTIVE ACTIONS IDENTIFIED IN THE TASK FORCE REPORT ON THE BLACK AND VEATCH FINDINGS

PLANT: Watts Bar Nuclear Unit
CATEGORY: /

2/14/8t

\_ Approved By:

Date:

TROMARMAL. . FRUITCEEFFEL CREEKLESTERE I. Verification of Corrective Action Implementation for Completed Work

Perform the following surveillance activity:

Verify that the deficiencies identified in the B&V findings have either been corrected or are being tracked. Verify completed work by sampling.

II. Verification of Corrective Action Implementation for Future Work

Perform the following surveillance activity:

Verify inspector training on Bergen Paterson drawing interpretation.

III. Assessment of Effectiveness of Corrective Action for Future Work

Perform the following surveillance activity:

Evaluate the current status of the IE Bulletin 75-14 program. Assess the effectiveness of this program and evaluate this category for closure based upon control by 79.14 or some other rationale.

Page 1 of 1

# DIVISION OF ENGINEERING DESIGN NONCONFORMANCE REPORT

MEDS Accession No. SWP '83 0111 036

|            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                 |                                         | -                  | 1 REPO              | AT NO    | ibnswp8 | 307 |
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| 2 PLANT    | WATTS BAR MUCLEAR PLANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Pennington/SWP  | /January                                | 1. 1983            |                     |          |         |     |
| ٠          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Pennington      | , , , , , , , , , , , , , , , , , , , , |                    |                     |          |         |     |
| 5] DESCRIP | Pipe support 03B-1AFW-R<br>Rev 904 and will not al<br>47B427-471 RO and there<br>3.9.3.4.2 C Part 4.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | fore does not m | eet the de                              | sign req           | uirements           | in FSA   | R       |     |
|            | This deficiency was ide                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ntified during  | Black and                               | Veatch t           | eview on            | finding  | F367.   | _   |
|            | inia dericine,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                 |                                         | 84                 | .1231               | Ε040     | 4.      | 3   |
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| 6 DATE OF  | OCCURRENCE EST (X ), ACT ( ) 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | [2/31/8]        | 3 SIGNIFIC                              |                    | ON ADVERSE          | TO QUALI | TY      |     |
|            | OF DISCOVERY Black & Veatch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Review          | 7                                       |                    | - 01                | 0 1)     |         |     |
| CO CINU    | DE IEN DES EP 8 01)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                 | 10 -SHANCH                              | HIEF/DATE          | JC Star             | dele-    | 1-11-13 | ·   |
| Support    | rt was installed correctly                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | v as shown on d | rawing 03E                              | 8-1AFW-81          | 49 6904 (           | see al:  | 4       |     |
| NCR 40     | rt was installed correctly<br>522 RO).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | v as shown on d | rawing 03E                              | 3-1AFW- <u>R</u> 1 | 49 F9Ñ4 (           | see al:  | •       |     |
| NCR 44     | rt was installed correctly<br>522 RO).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | v as shown on d | rawing 03E                              | 3-1AFW-R 1         | 49 F9Õ4 (           | see al:  | •       |     |
| NCR 44     | rt was installed correctly<br>522 RO).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | v as shown on d | rawing 03E                              | 3-1AFW-R1          | 49 ¤9ñ4 (           | see al:  |         |     |
| NCR 44     | rt was installed correctly                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | v as shown on d | rawing 036                              | 3-1AFW-R1          | 49 <b>- 84</b> 04 ( | see al:  |         |     |
| NCR 44     | rt was installed correctly                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | v as shown on d | rawing 036                              | 3-1AFW-R1          | 49 <b>- 84</b> 04 ( | see al:  | a .     |     |
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| NCR 44     | rt was installed correctly                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | v as shown on d | rawing 036                              | B-TAFW-RT          | 49 <b>- 84</b> 04 ( | see al:  |         |     |
|            | 522 RO).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                 |                                         | 3-1AFW-R1          | 40 E4Ñ4 (           |          |         |     |
| 12 CORREC  | TIVE ACTION DEVIATES FROM A DESI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                 |                                         | <b>₹€</b> \$ □     |                     | <u></u>  |         |     |

|             | NONCONFORMANCE REPORT                                                                                                                                                                                                                       | (                      | I REPORT NO      | WENSWIR JO7,                          |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------------------|---------------------------------------|
| जि          | ASSIGNABLE CAUSE: IREQUIRED IF SIGNIFICANT)                                                                                                                                                                                                 |                        |                  |                                       |
| -           | Pipe support 03B-1AFW-R149 was not installed according t<br>support drawing required that the pipe sleeve be cut off<br>the sleeve was notched with a torch to provide clearance<br>pattern of cutting, the clearance proved to be insuffic | f flush w<br>e, but du | ith the wall     | ; however,                            |
|             |                                                                                                                                                                                                                                             |                        |                  |                                       |
|             | · .                                                                                                                                                                                                                                         |                        |                  |                                       |
| 10          | THIS IS A GENERIC CONDITION YES NO 🗓                                                                                                                                                                                                        |                        |                  |                                       |
| 10          | ACTION REQUIRED TO PREVENT RECURRENCE: IREQUIRED IF SIGNIFICANTI                                                                                                                                                                            |                        |                  |                                       |
|             | The Hanger Engineering and Quality Control units will reemphasizing for explicit implementation of drawing requispecified on the drawings.                                                                                                  |                        |                  | _                                     |
|             |                                                                                                                                                                                                                                             |                        |                  |                                       |
| }           |                                                                                                                                                                                                                                             |                        |                  |                                       |
| !           |                                                                                                                                                                                                                                             |                        |                  | , , , , , , , , , , , , , , , , , , , |
|             | ſ                                                                                                                                                                                                                                           | •                      |                  | i                                     |
|             | 1                                                                                                                                                                                                                                           | •                      |                  |                                       |
| 19          | INDEPENDENT HEVIEW: Have B / homen: 12/7/84                                                                                                                                                                                                 |                        |                  |                                       |
| =           | LABOR EST. 1 J. ACT. 1 / MH [21] SCHEDULE EST 1                                                                                                                                                                                             | I, ACT ( )             | N/A              | DAYS                                  |
| 22          | ACTIVITY NO. N/A V 23 TASK DESCRIPTION N/A                                                                                                                                                                                                  |                        | 24 DATE INITIA   | TEO N/A                               |
| 25          | REMARKS.                                                                                                                                                                                                                                    |                        |                  |                                       |
|             | The original of NCR WBNSWP8307 has been lost.                                                                                                                                                                                               |                        |                  | I                                     |
|             |                                                                                                                                                                                                                                             |                        |                  |                                       |
|             |                                                                                                                                                                                                                                             |                        |                  |                                       |
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|             |                                                                                                                                                                                                                                             |                        |                  |                                       |
|             |                                                                                                                                                                                                                                             |                        |                  |                                       |
| 27 O        | ISTRIBUTION: CONST PROJECT MANAGER G. L. Pennington, 374 GB-K 26 AI                                                                                                                                                                         | LL EN DES A            | CTION COMPLETE   |                                       |
| 28          | EN DES PROJECT MANAGER CHIEF, ESB                                                                                                                                                                                                           |                        | · //             | 1011011                               |
|             | OFFICE OF QA NEB Ifor Significant NCRsI**                                                                                                                                                                                                   | 10011511               | Conference .     | 72/19/84                              |
| <del></del> | MEDS CIS NSRS (for Significant NCRs)*                                                                                                                                                                                                       |                        | HIEF/ORG,        | DATE                                  |
|             |                                                                                                                                                                                                                                             | <b>CEB</b> '84         | 1219             | 007                                   |
|             | DISTRIBUTE AFTER THIS SIGNATURE  HANDCARRY COPY TO NEB-NLS                                                                                                                                                                                  |                        | IEDS ACCESSION N | 10.                                   |

2 3 4

### EN DES NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

NCR NO. WBN SWP 8307

SIGNIFICANT YES ₩ NO □ REPORTABLE YES ¥ NO □

- A. Have any analyses, contracts, memorandums, etc., requiring EN DES work been generated? Yes O No M If yes, list in (C) below.
- B. Have all ECNs related to the NCR been issued?

  N/A X Yes No.11 If yes, list in (C) below.
- Ç. Documents related to the NCR (ECN, analyses, memos, contract No., etc.)

|    | REF OR MEDS<br>ACCESS. NO. | COMPLETION DATE |
|----|----------------------------|-----------------|
| NA | <br>                       |                 |
|    | <br>                       |                 |
|    |                            |                 |
|    | <br>                       |                 |

- D. Is action by organization outside EN DES required? Yes No Organization tracking No. CONST NCR 4622 Ro
- E. Has all necessary EN DES information been transmitted to an organization outside EN DES to enable the completion of work required?

  Yes No N/A If yes, list in (C) above.
- F. Is all EN DES action complete? Yes  $\nearrow$  No  $\square$
- G. Remarks:

EN Verified By R. J. Pratt Date 12/7/84

Page \_\_ of

2. Verify that NCR WBNCEB8203 was closed.

Results: NCR WBNCEB8203 was closed by EN DES on May 12, 1983 (CEB 830512 010). NCR WBNCEB8203 final report to NRC was issued May 27, 1983 (NEB 830531 632).

- B. Performed the following surveillance activities to verify corrective action implementation for future work.
  - Verify that training has included the referencing of construction specification N3C-928 on hanger drawings.

Results: Reviewed hanger drawings 47A464-10-18 R1, 47A464-10-17 R1, 47A400-6-17H R1, 47A050-1Q R4, and 47A050-1T R4 to verify if they referenced N3C-928 for the purpose of providing OC with requirements for locating attachments on embedded plates. Hanger drawings reviewed did not contain the correct references to N3C-928. NCR WBNQMS8401 was prepared to document this condition.

2. Verify that training has included the use of EN DES-EP 4.03.

Results: Interviewed Charlie Richardson, WBEP-Mechanical Design, and W. W. Wilson, Jr., WBEP-Civil Design, to verify if they were familiar with the requirements of EN DES-EP 4.03, Appendix No. 4. Each employee knew the requirements of EP 4.03, Appendix No.

Interviewed Doug E. Martin, WBEP Supervisor Civil Design Section, to verify if EP 4.03 training had been conducted in his section and documented in accordance with the requirements of EN DES-EP 1.01, section 10.5. Doug Martin stated the training had been conducted, but he could not locate the required attendance roster. WBEP civil design employees' work observed during this surveillance verified they were familiar with the requirements of EN DES-EP 4.03, Appendix No. 4. Therefore, a recommendation to conduct the EP 4.03 training and to document that training was made to Doug Martin.

On November 2, 1984, Doug Martin conducted EP 4.03 training with employees of his section (WBP 841102 008).

- C. Performed the following surveillance activities to assess the effectiveness of corrective action for future work:
  - Assess the effectiveness of the corrective action for one FCR involving multiple attachments to an embedded plate. Select an FCR which was initiated during 1984.

Results: Reviewed FCR EP6429 to the requirements of project construction specification N3C-928 and EN DES-EP 4.03, Appendix No. 4, with no deviations noted.

Page 2 of 4

The methods used by EN DES to evaluate FCR EP6429 are effective in determining if unique embedded plates have been overloaded by the addition of multiple supports that violates N3C-928 requirements.

#### IV. Documents Reviewed:

#### Hanger Drawings:

47A464-10-18 R1

47A464-10-17 R1

47A400-6-17H R1

47A050-1Q R4 47A050-1T R4

47A060-1 R2

47A450-1 RO

47A464-1 R1

47A400-7-1 RO

#### Embedded Plate Drawings:

48B1223-6A-29 R1

48W1228-2 R2

48B1225-2A-49 RO

#### Field Change Requests:

EP-1791 (WBN 830819 318)

EP-1795 (WBN 830819 322)

EP-6429 (WBN 840911 304)

H-10917 (WBN 831109 353)

EP-6530 (WBN 840307 348)

EP-6428 (WBN 840119 353)

EP-6403 (WBN 840119 344)

EP-6431 (WBN 840119 313)

#### Deviation Report:

CO3-S-84-0089-D01 (QMS 841003 204)

#### Procedures:

EP 1.01 R14, "EN DES Engineering Procedure"
EP 4.03 R10, "Field Change Requests Initiated by CONST"
EP 3.04 R13, "EN DES Construction Specifications - Preparation, Review, and Approval"

Page 3 of 4

Project Construction Specification:

N3C-928, "Locating Attachments on Embedded Plates"

EN DES Calculations:

WC6-1-218, "Minor Load Guidelines - EP 4.03, section 3.0, Technical Specification" (WBP 840515 212)

O3B1AFWR106, "Auxiliary Feedwater System Pipe Support Drawing No. O3B-1AFW-R106" (WBP 840309 104)

WCG-2-54, "Auxiliary Building - Miscellaneous Steel Embedded Parts, Volume 7" (SWP 830214 024)

#### Memorandums:

R. W. Cantrell to J. W. Anderson, "Evaluation of Corrective Action Response - Deviation Report CO3-S-84-0089-DO1" (CEB 840625 006)

E. Gray Beasley to J. C. Standifer, "Deviation Report No. C03-S-84-0089-D01 - Corrective Action Verification" (QMS 841003 204)

J. C. Standifer to Guenter Wadewitz, "Watts Bar Nuclear Plant -Interim Requirements for Locating Attachments on Embedded Plates -Quality Information" (CEB 821110 017)

Guenter Wadewitz to J. C. Standifer, "Watts Bar Nuclear Plant -Construction Specification N3C-928 for Locating Attachments on Embedded Plates" (WBN 831019 009)

D. E. Martin to WBRP Files, "Field Change Requests Initiated by OC-EP4.03 R10" (WBP 841102 008)

Nonconformance Reports (NCRs):

GENCEB8208 (CEB 840405 004)
WBN3842 (WBN 811222 103)
WBNCEB8203 (CEB 830512 010)

#### V. List of Personnel Contacted:

| Name                                                                              | Title                                                                                                                                                                       | Organization                         |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| Charlie Richardson<br>R. G. Pratt<br>Doug Martin<br>Bill Wilson<br>Wayne Smathers | SC-4, Mechanical Engineer<br>M-5, Mechanical Design Supv.<br>M-5, Civil Design Supervisor<br>SC-3, Civil Engineer<br>M-5, On-Site Watts Bar<br>Engineering Analysis Section | WBEP<br>WBEP<br>WBEP<br>WBEP<br>WBEP |

VI. Scoping Document (Attached)

Page 4 of 4

QUALITY HANAGEMENT STAFF
SCOPING DOCUMENT FOR THE ASSESSMENT
OF THE EFFECTIVENESS OF CORRECTIVE ACTIONS
IDENTIFIED IN THE TASK FORCE REPORT ON THE
BLACK AND VEATCH FINDINGS

PLANT: Vatts Bar Nuclear Plant Units 1 and 2
CATEGORY: 9

Prepared By: 2 Brock
Date: 9/19/84

Approved By: 42-12-15

I. Verification of Corrective Action Implementation for Completed Work

Perform the following surveillance activity:

Verify the results of the sampling program by sampling one of the 69 embedded plates evaluated. Verify that NCR WBNCEB8203 was closed.

II. Verification of Corrective Action Implementation for Future Work

Perform the following surveillance activity:

Verify that training has included: (a) the referencing of construction specification N3C-928 on hanger drawings and (b) the use of EN DES-EP 4.03.

III. Assessment of Effectiveness of Corrective Action for Future Work

Perform the following surveillance activity:

Assess the effectiveness of the corrective action for one FCR involving multiple attachments to an embedded plate. Select an FCR which was initiated during 1984.

Page 1 of 1

### DIVISION OF ENGINEERING DESIGN NONCONFORMANCE REPORT

MEDS Accession No.

CEB 83 06 08 009

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | [1] REPORT NO. GENCEB8302 R1               |  |  |  |  |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|--|--|--|--|--|
| 2 PLANT BFN, SQN, WBN, BLN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3 UNIT All                                 |  |  |  |  |  |
| 4 PREPARER/ORGANIZATION/DATE D. W. Hargroves/EN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                            |  |  |  |  |  |
| 6 DESCRIPTION OF CONDITION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>A</b>                                   |  |  |  |  |  |
| See Attachment 1 for description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 840803F0055 <b></b>                        |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                            |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                            |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                            |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                            |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                            |  |  |  |  |  |
| 6 DATE OF OCCURRENCE EST ( X), ACT. ( ) 1976                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 9 SIGNIFICANT CONDITION ADVERSE TO QUALITY |  |  |  |  |  |
| 7 METHOD OF DISCOVERY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | VES NO                                     |  |  |  |  |  |
| B UNID CODE (EN DES-EP 8.01)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 10 BRANCH CHIEF/DATE LONG BUNCH CEDE 6/4   |  |  |  |  |  |
| The program, user's manual, and program manual have been modified to automatically calculate these direction cosines based on more easily attainable plant coordinates. The output has been modified to provide more directly usable local and global loads rather than loads in the record system. The user's manual is being modified to reflect these changes.  These modifications to the program relieve the analyst of the task of computing these coordinate transformations by hand, thus alleviating the confusion regarding these conversions. The output is similarly reported in the global and program—defined local systems, alleviating the need for the anchor designer to perform further coordinate conversions.  Reanalyze all problems which were analyzed using the direction cosines of ANCHOR for all affected plants using version 2.0. Compare anchor loads to the previous design loads and redesign anchors where necessary.  See Attachment 2 for plant specific corrective action. |                                            |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | HHEMENT YEST NO T                          |  |  |  |  |  |
| 22 CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REGI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | EXCEPTION REQUEST NO.                      |  |  |  |  |  |
| 13 DESIGN CRITERIA DOCUMENT NO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | [15] SCHEDULE IMPACT   11   A   N          |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                            |  |  |  |  |  |

**NONCONFORMANCE REPORT** T REPORT NO. GENCEB8302 R1 16 ASSIGNABLE CAUSE IREQUIRED IF SIGNIFICANTI Incorrect data specifications contained in the user's manual. Subsequent misuse of program. Misinterpretation of output. THIS IS A GENERIC CONDITION YES 🗌 18 ACTION REQUIRED TO PREVENT RECURRENCE (REQUIRED IF SIGNIFICANT) Version 2.0 of the ANCHOR program will be used exclusively in the future to prevent recurrence of this problem. 'INDEPENDENT REVIEW: 19 David Lours LABOR EST. ( ), ACT. ( ) 20 SCHEDULE EST ( ), ACT ( ) DAYS 22 ACTIVITY NO. 23 TASK DESCRIPTION 24 DATE INITIATED Revision 1 is issued to clarify description of condition. It has been determined that these anomalies do not affect BLN because no skewed anchors were designed which use this particular direction cosine option in question nor do they affect BFN becuase the ANCHOR program has not been used to date. This NCR is superseded by GENCEB8402, MEDS accession number CEB 840312 003. 27 DISTRIBUTION 26 ALL EN DES ACTION COMPLETE CONST PROJECT MANAGER EN DES PROJECT MANAGER CHIEF, ESB CHIEF, ESB
OFFICE OF CIA
NEB Ifor Significant NCRs1\*\*
MEDS CIS
NSRS (for Significant NCRs)\*
ASSISTANT TO THE MANAGER OF OEDC IQuality **'84** 0**7** 1 7 006 and Nuclear Safety) -- for Significant NCRs
DISTRIBUTE AFTER THIS SIGNATURE
HANDCARRY COPY TO NES-NLS CEB

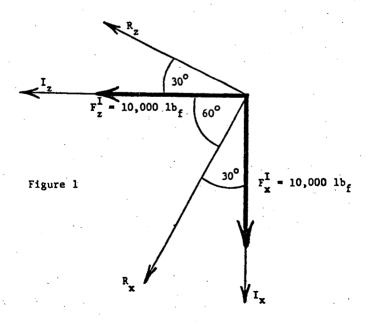
MEDS ACCESSION NO.

#### NCR GENCEB8302 R1 Attachment 1

#### Description of Condition:

Discrepancies have been found in the input specifications for the direction cosines option of the ANCHOR program. The output could also have been misinterpreted in the wrong coordinate system. This option only affects anchors that are skewed relative to the plant global coordinate system.

The purpose of the anchor load program is to combine the loads from both sides of an anchor, compare these loads to allowables, and provide total loads on the anchor. These loads on each side of the anchor are generally determined by a separate stress analysis computer program. If the loads on each side of the anchor are in different coordinate systems, the direction cosines option of the ANCHOR program must be employed to convert these loads to a consistent coordinate system. This system is referred to as the record coordinate system in ANCHOR. Page III-4 of the ANCHOR program defines these direction cosines from the input system (the system used to define loads in the stress analysis program) to the record system. These input specifications are in error. To be correct, they should define the direction cosines from the record system to the input system.



This subtle difference can best be illustrated with an example. Consider a 10,000  $1b_f$  load in the x and z directions of the input (I) system as shown in figure 1. If the record (R) system is skewed  $30^\circ$  from the input system as shown (common  $Y_I = Y_R$  up out of page), it can be shown that these loads resolve into the record system as:

$$F_x^R = 13,600, F_z^R = 3,660$$

The ANCHOR manual describes the system relations, relative angles, and direction cosines as:

$$\frac{1}{x}$$
 to  $\frac{R}{x}$   $\frac{1}{x}$  to  $\frac{R}{y}$   $\frac{1}{x}$  to  $\frac{R}{z}$ , respectively.  
30° 90° 120°  
0.8660 0.0 -0.5000

When input to ANCHOR, it will resolve loads of:

$$F_x^R = 3,660 \text{ and } F_z^R = 13,660$$
,

which are in error. When correctly defined as:

the ANCHOR program will correctly resolve the loads. Since the resultant loads are reported in the record system and must be resolved into global and local loads by similar direction cosines, the anchor load designer could similarly misinterpret the results.

#### NCR GENCEB8302 R1 Attachment 2

#### Corrective Action

BLN units 1 and 2:

No corrective action required -- see remarks.

BFN units 1, 2, and 3: No corrective action required since ANCHOR program has not been used to date.

WBN unit 1:

Anchors have been redesigned per ANCHOR program, version 2.0. Supports have been redesigned and installed.



## TENNESSEE VALLEY AUTHORITY

Division of Construction



### WATTS BAR NUCLEAR PLANT

### QUALITY CONTROL PROCEDURE

QCP-4.56

TITL F:

IE-79-14 WALKDOWN

|                           | REVISION O           | R6       | R7 | R8 | <b>R9</b> | R10 |
|---------------------------|----------------------|----------|----|----|-----------|-----|
|                           | DATE 11/15/82        | 01/04/84 |    |    |           |     |
| PREPARED BY:              | JAT<br>Fred J. Evans | h the    |    |    |           |     |
| INDEPENDENT<br>REVIEW BY: |                      | Bor      |    |    |           |     |
| P&T<br>SUBMITTED: AQM     | KW<br>JAT for SJ     | KW 100   |    |    |           |     |
| RECOMMENDED: CEO          | R. W. Olson          | 745      |    |    |           |     |
| APPROVED: QMO             |                      | BUNK     |    |    |           |     |
| APPROVED: PMO             | Guenter Wadewitz     | 1W       |    |    | ·         |     |

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| IVA             | REVISION                                                                                                                                                                                                        | V LOG            |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| Title: IE-      | VBNP-QCP-<br>79-14 WALKDOWN 4.56                                                                                                                                                                                |                  |
| Revision<br>No. | DESCRIPTION_OF REVISION                                                                                                                                                                                         | Date<br>Approved |
| 1               | Revised to incorporate fevisions to EN DES-SEP-82-13.                                                                                                                                                           | 12/15/82         |
| 2               | Revised to incorporate revisions to EN DES-SEP-82-13 and made minor corrections to clarify inspections on valves.                                                                                               | 02/11/83         |
| 3               | Revised to incorporate revisions to EN DES-SEP-82-13 and made minor corrections to clarify inspections on valves.                                                                                               | 02/15/83         |
| 4               | Revised section 6.2.8 and 6.4.6 to clarify inspection data requirements on EN DES inspection drawings and attachment B.                                                                                         | 04/06/83         |
| 5               | Revised section 6.2.4 and 6.4.3 to delete physical measurement requirement of manual valve operators to comply with EN DES-SEP-82-13 Rev. 2 section 4.1.2.6                                                     | 04/29/83         |
| 6               | Revised paragraphs 6.2.4 and 6.4.3 to add manual operators to agree with SEP-82-13 R3 and memorandum from J. C. Standifer (CEB 83 0510 013). Added paragraphs 6.2.5 and 6.4.4 to agree with R3 of SEP-82-13.    | 01/04/83         |
|                 | Renumbered sections 6.2.5 through 6.2.13 and sections 6.4.5 through 6.4.11. Revision bars not shown for renumbering. Made minor editorial changes reflecting change from QC&R to DCU and RIU to ROC throughout. |                  |
|                 | Revision bars not shown.                                                                                                                                                                                        |                  |
|                 |                                                                                                                                                                                                                 |                  |
|                 |                                                                                                                                                                                                                 |                  |
|                 |                                                                                                                                                                                                                 |                  |
|                 |                                                                                                                                                                                                                 |                  |
|                 |                                                                                                                                                                                                                 |                  |
| L               |                                                                                                                                                                                                                 |                  |

IE-79-14 W LKDOWN

#### 1.0 PURPOSL

1.1 This procedure specifies the inspection and documentation requirements to verify the as-installed configuration of safety-related rigorously analyzed and alternately supported piping systems identified in reference 3.3.

#### 2.0 SCOPE

2.1 This procedure is applicable to the piping systems outlined in reference 3.3.

#### 3.0 REFERENCES

海南

- 3.1 TVA Construction Specification N3C-912, "Support and Installation of Piping Systems in Category I Structures"
- 3.2 WBNP-QCI-4.56, "IE-79-14 Accountability"
- 3.3 EN DES-SEP-82-13, "Program for NRC-OIE Bulletin 79-14, Phase 1
  Inspections at Watts Bar Nuclear Plant, Unit 1"

#### 4.0 DEFINITIONS

- 4.1 <u>Inspection Package</u>—An assembly of drawings pertaining to a specific part of a piping system.
- 4.2 <u>Discrepancy-Any</u> item found not to conform to the applicable EN DES specifications and/or inspection requirements or is inaccessible to complete inspection.
- 4.3 <u>Support</u>--Standard and nonstandard supports utilized in restraining the pipe in any one or a combination of the three orthogonal directions (axial, lateral, vertical).
- 4.3.1 Component Standard Supports-Vendor-supplied items; for example, snubbers, springs, rod hangers, and sway struts.
- 4.3.2 Nonstandard (rigid) Supports—Any structural shape or plate welded around the pipe to provide restraint in any one or a combination of the three orthogonal directions. (The vast majority of the alternate analysis supports falls in this category.)
- 4.4 <u>B001 Pipe Connection</u>—Small branch line connection qualified by B001 support criteria.

|                   | WBNP-QCP                                                          |
|-------------------|-------------------------------------------------------------------|
| IR-79-14 WALKDOWN | D. A. Caracha and L. L. L. C. C. C. C. C. C. C. C. C. C. C. C. C. |
| IE-79-14 WALKDOWN | Nn 4.56                                                           |

Rev. 6

#### 5.0 RESPONSIBILITIES

Title

- 5.1 The Mechanical Quality Control Unit (MQC) is responsible for performing and documenting all inspections related to piping configuration, piping properties, floor and wall penetrations, and valves.
- 5.2 The Hanger Quality Control Unit (HQC) is responsible for performing and documenting all inspections related to piping supports.
- 6.0 PROCEDURE
- 6.1 Test Equipment
- 6.1.1 Measuring tape or rule
- 6.1.2 Level
- 6.1.3 Plumb bob
- 6.1.4 Calibrated ultrasonic thickness measuring equipment
- 6.1.5 Gap (feeler) gauge
- 6.2 Pipe Configuration Inspection-Rigorously Analyzed Piping
- 6.2.1 Starting at one end of the piping segment, visually inspect the piping geometry and size against the EN DES inspection drawing (including the referenced 47B001 type connections).
- 6.2.2 Verify that only those fittings (elbows, reducers, tees) or pipe bends shown on the EN DES inspection drawing are installed.
- 6.2.3 Visually compare the installed location of all valves on the EN DES inspection drawing to the location shown on EN DES inspection drawing. Identify additional or missing valves. Accurately dimension (reference from another feature along the piping run) any discrepancies on the EN DES inspection drawing and record and verify the data listed below on attachment C for a maximum of three of the largest valves inspected.
- 6.2.3.1 TVA tag number
- 6.2.3.2 TVA or W mark number
- 6.2.3.3 Valve drawing number and revision
- 6.2.3.4 Valve type (gate, globe, check, etc.)
- 6.2.3.5 Valve manufacturer

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6.2.3.6 Manufacturer's identification number

6.2.3.7 Pipe size and material

6.2.3.8 Valve length

6.2.3.9 Type of valve end connection (butt welded or flanged)

6.2.3.10 Type of operator (manual, motor, or air)

6.2.3.11 Operator manufacturer

6.2.3.12 Operator identification number

6.2.3.13 Overall length of valve operator measured from pipe centerline along operator centerline.

6.2.4 Verify by physical measurement all valve operator (manual, motor, or air) orientations shown on the EN DES inspection drawing.

6.2.5 Note as a discrepancy any as-constructed element of valve installation that does not agree with the design documentation.

6.2.6 Using calibrated ultrasonic thickness measuring equipment, measure the pipe wall thickness at a minimum of three locations on the EN DES inspection drawing.

6.2.7 Record data on EN DES inspection drawing.

6.2.8 Verify that the piping passing through any sleeves is located according to reference 3.1. If unacceptable, record vertical and horizontal dimensions between pipe wall and inside of sleeve wall on attachment B and the EN DES inspection drawing. Note any FCR or NCR on the EN DES inspection drawing.

6.2.9 Identify potential interferences with structures, adjacent supports, piping, and piping components. The inspection for interferences includes all branch lines less than 2-1/2 inches in diameter which are not shown on another isometric out to the first rigid support or for a minimum distance of ten linear feet, whichever is less. Where insulation is not in place, identify potential interferences assuming that it is in place. Describe the potential interfering feature and accurately note the location, clearance measurement, and which side of the pipe is closest to interference, on attachment B. Note each discrepancy by number on the inspection drawing. Also note on the inspection drawing if insulation is not installed.

6.2.10 Verify insulation thickness and type shown on EN DES inspection drawing. Report difference in insulation size and type as a discrepancy.

- 6.2.11 Note as a discrepancy any inaccessible piping and the reason for the inaccessibility on the EN DES inspection drawing. Include the inaccessible piping discrepancies in the "miscellaneous" section of attachment B.
- Provide as-constructed data for segments which are not in conformance with the EN DES inspection drawing. If the EN DES inspection drawing differs from the physical piping drawings used for fabrication, record drawing revision showing as-constructed piping geometry. If pipe configuration does not conform to the physical piping drawing, provide as-constructed data on a clear sketch and record the location of the discrepancy on the EN DES inspection drawing. Note additional items such as flanges, strainers, and attachment equipment not shown on the EN DES inspection drawing. Note as a discrepancy any damaged pipe, flexible hose, or bellows on the EN DES inspection drawing.
- 6.2.13 Date and initial all entries made on the EN DES inspection drawing and any as-constructed sketches in 6.2.11.
- 6.3 Support Inspection-Rigorously Analyzed Piping
- 6.3.1 Visually compare installed location of supports with location on EN DES inspection drawing. If installed location does not agree, record the measured location on "A" size support drawing and accurately dimension any discrepancy on the EN DES inspection drawing.
- 6.3.2 Visually verify restraint installed direction with EN DES inspec-
  - Note: Unistrut clamps that act as nonaxial supports have washers installed.
- 6.3.3 Verify installed support type (i.e., spring, snubber, rod, and structural frame) with EN DES inspection drawing.
- 6.3.4 Identify and record as a discrepancy any additional or missing supports.
- 6.3.5 Inspect supports using the individual "A" size support drawing verifying the following items:
- 6.3.5.1 Visually verify all structural members/parts are installed.
- 6.3.5.2 Verify major member length and size are acceptable and record results on the "A" size support drawings and attachments.
- 6.3.5.3 Visually verify weld size and that all specified welds are in place.

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- 6.3.5.4 Visually verify required anchor bolts are installed and in intimate contact with the attachment plate. Where a washer is used, verify that it cannot be moved by hand.
- 6.3.5.5 Visually verify that required jam nuts, cotter keys, and other locking devices are installed.
- 6.3.5.6 Verify snubber and/or spring can size. Verify by physical measurement the snubber cold set dimension.
- 6.3.5.7 Verify component standard support sizes.
- 6.3.5.8 Verify lug size.
- 6.3.5.9 Verify clearances conform to "A" size support drawing and/or reference 3.1. Record actual clearance (axial, lateral, and vertical) on the "A" size support drawing and attachment E.
- 6.3.5.10 Visually verify that there is no obvious physical damage to the support.
- 6.3.6 Note any inaccessible supports as a discrepancy and the reason for the inaccessibility on the EN DES inspection drawing and record in the "Miscellaneous" section of attachments D and E.
- 6.3.7 Record all discrepancies noted on the "A" size support drawing. If no discrepancies are noted, so indicate on the "A" size support drawing. The results of the individual support inspection are also recorded on the EN DES inspection drawing by either entering an assigned discrepancy tracking number (obtained from the Responsible Engineering Unit) or, in the case of no discrepancies, placing a check mark next to the support mark number. Date and initial all entries on the EN DES inspection drawing and the "A" size support drawing.
- 6.3.8 Record inspection data on attachment E.
- 6.4 Pipe Configuration Inspection--Alternately Supported Pipe
- 6.4.1 Starting at one end of the pipe segment, visually check pipe configuration and size against the physical piping drawings (including B001 type connections in this inspection). Accurately sketch and dimension differences between the installed piping and the physical piping drawing.
- 6.4.2 Visually compare the installed location of all valves in accordance with physical piping drawing to location shown on physical piping drawing. Identify additional, missing, or mislocated valves. Accurately dimension any discrepancies on the physical piping drawing. Verify and record the data listed below on attachment C for a maximum of three of the largest valves inspected.

- 6.4.2.1 TVA tag number
- 6.4.2.2 TVA or W mark number
- 6.4.2.3 Valve drawing number and revision
- 6.4.2.4 Valve type (gate, globe, check, etc.)
- 6.4.2.5 Valve manufacturer
- 6.4.2.6 Manufacturer's identification number
- 6.4.2.7 Pipe size and material
- 6.4.2.8 Valve length
- 6.4.2.9 Type of valve end connection (butt welded or flanged)
- 6.4.2.10 Type of operator (manual, motor, or air)
- 6.4.2.11 Operator manufacturer
- 6.4.2.12 Operator identification number
- 6.4.2.13 Overall length of valve operator measured from pipe centerline along the operator centerline.
- 6.4.3 Verify by physical measurement all valve operator (manual, motor, or air) orientations shown on the physical piping drawing.
- 6.4.4 Note as a discrepancy any as-constructed element of valve installation that does not agree with the design documentation.
- 6.4.5 Using calibrated ultrasonic thickness measuring equipment, verify the pipe wall thickness for a minimum of three locations on the physical piping drawing and record the data on the physical piping drawing.
- 6.4.6 Verify that the pipe is located in sleeves according to reference 3.1. If unacceptable, record vertical and horizontal dimensions between pipe wall and inside of sleeve wall on attachment B and the physical piping drawing. Note any FCR or NCR on the physical piping drawing.

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- Identify potential interferences with structures, adjacent supports, piping, and piping components. The inspections for interferences includes all branch lines less than 2-1/2 inches in diameter which are not shown on another isometric out to the first rigid support or for a minimum distance of ten linear feet whichever is less. Where insulation is not in place, identify potential interferences assuming that it is in place. Describe the potential interfering feature and accurately note the location, clearance measurement, and which side of the pipe is closest to interference, on attachment B.

  Note each discrepancy by number on the inspection drawing. Also note on the inspection drawing if insulation is not installed.
- 6.4.8 Record installed insulation thickness and type on the physical piping drawings.
- 6.4.9 Note as a discrepancy any inaccessible piping and the reason for the inaccessibility on the physical piping drawing and record in the "miscellaneous" section of attachment B.
- 6.4.10 Provide as-constructed data for pipe segments which are not in conformance with the physical piping drawing on a clear sketch.

  Record the location of the discrepancy on the physical piping drawing. Note additional items such as flanges, strainers, and attached equipment not shown on the physical piping drawing. Note as a discrepancy any damaged pipe, flexible hose, or bellows on the physical piping drawing.
- 6.4.11 Date and initial all entries made on the physical piping drawing and any as-constructed sketches in 6.4.9.
- 6.5 Support Inspection--Alternately Supported Piping
- 6.5.1 Visually compare installed location of supports with location on the physical piping drawing. If installed location does not agree, record installed location on "A" size support drawing and accurately dimension any discrepancy on the physical piping drawing.
- 6.5.2 Visually verify restraint installed direction with the "A" size support drawing.

Note: Unistrut clamps that act as nonaxial supports have washers installed.

- 6.5.3 Verify installed support type (i.e., spring, snubber, rod, and structural frame) with the "A" size support drawing.
- 6.5.4 Identify and record additional or missing supports.

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- 6.5.5 Inspect supports using the individual "A" size support drawing, verifying the following items:
- 6.5.5.1 Visually verify all structural members/parts are installed.

- 6.5.5.2 Verify major member length and size are acceptable and record results on the "A" size support drawings and attachment E.
- 6.5.5.3 Visually verify weld size and that all specified welds are in
- 6.5.5.4 Visually verify required anchor bolts are installed and in intimate contact with the attachment plate. Where a washer is used, verify that it cannot be moved by hand.
- 6.5.5.5 Visually verify that required jam nuts, cotter keys, and other locking devices are installed.
- 6.5.5.6 Verify snubber and/or spring can size. Verify by physical measurement the snubber cold set dimension.
- 6.5.5.7 Verify component standard support sizes.
- 6.5.5.8 Verify lug size.
- 6.5.5.9 Verify clearances conform to "A" size support drawing and/or reference 3.1. Record actual clearance (axial, lateral, and vertical) on the "A" size support drawing and attachment E.
- 6.5.5.10 Visually verify that there is no obvious physical damage to the support.
- 6.5.6 Note any inaccessible supports as a discrepancy and the reason for the inaccessibility on the physical piping drawing and record in the "Miscellaneous" section of attachments D and E.
- 6.5.7 Record all discrepancies noted on the "A" size support drawing. If no discrepancies are noted, so indicate on the "A" size support drawing. The results of the individual support inspection are also recorded on the physical piping drawing by either entering an assigned discrepancy tracking number (obtained from REU) or in the case of no discrepancies, placing a check mark next to the support mark number; date and initial all entries on the physical piping drawing and the "A" size support drawing.
- 6.5.8 Record inspection data on attachment E.

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## 7.0 ACCEPTANCE CRITERIA

### 7.1 Rigorously Analyzed Piping Systems

- 7.1.1 Rigorously analyzed piping location and configuration meet the requirements of the EN DES analysis isometric and reference 3.1.
- 7.1.2 The installed configuration and location of valves are in accordance with the EN DES analysis isometric. A difference in valve operator orientation greater than 15 degrees from the EN DES analysis isometric requirement is considered a discrepancy.
- 7.1.3 The installed location and configuration of supports meet the requirements of the EN DES analysis isometric, the "A" size support drawing, and reference 3.1.

#### 7.2 Alternately Supported Piping Systems

- 7.2.1 Alternately analyzed piping location and configuration meet the requirements of the physical piping drawing and reference 3.1.
- 7.2.2 The installed configuration and location of valves are in accordance with the physical piping drawing. A difference in valve operator orientation greater than 15 degrees from the physical piping drawing requirement is considered a discrepancy.
- 7.2.3 The installed location and configuration of supports meet the requirements of the physical piping drawing and reference 3.1.
- 7.3 Required rework is performed in accordance with the corrective action defined by the REU and/or EN DES on the applicable inspection data sheet.

#### 8.0 DOCUMENTATION

- 8.1 Each inspection package is assigned a unique identifier number by the REU in accordance with reference 3.2.
- 8.2 Each discrepancy noted against an individual inspection package is assigned a unique discrepancy tracking number by the REU in accordance with reference 3.2.
- 8.3 Required rework is inspected and documented in accordance with the applicable Quality Control Procedure (QCP).
- 8.4 Inspection results are summarized on attachment B for piping and valves and attachment D for supports by the Responsible Quality Control Unit (RQC).

- 8.5 When the required rework is complete and acceptable, the RQC initials and dates the "acceptance" section of the applicable attachment for each discrepancy. When all discrepancies are resolved for the pipe and/or support section of the inspection package the RQC signs and dates the "final acceptance" section of the applicable attachment and the applicable section of attachment A. Individual pipe support inspections are also signed and dated by the RQC in the "final acceptance" section of attachment E. Attach the "A" size support drawing to the applicable attachment E.
- 8.6 Attachments A, B, C, D, and E are Life of Plant (LOP) documents. All attachments and drawings are maintained in the inspection package.

  When all inspections are complete and accepted, the entire inspection package is transmitted to the Document Control Unit (DCU) for review and storage.
- 9.0 ATTACHMENTS
- 9.1 Attachment A-IE-79-14--Walkdown Inspection Data Card
- 9.2 Attachment B-IE-79-14--Inspection Data Sheet for Piping and Valves
- 9.3 Attachment C-IE-79-14--Inspection Data Sheet for Valves
- 9.4 Attachment D-IE-79-14--Inspection Summary Data Sheet for Supports

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9.5 Attachment E-IE-79-14--Individual Support Inspection Data Sheet

# IE-79-14 WALKDOWN INSPECTION DATA CARD

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# IE-79-14 Inspection Data Sheet For Piping and Valves

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WBNP-QCP-4.30 ACA Attachment B LOP Page 2 of 3 Sheet \_\_\_\_ of \_\_

# 1E-79-14 Inspection Data Sheet for Piping and Valves Continuation Page

| pection Package Computer ]<br>pection Drawing No. and re                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | D.                                        |                       |                                          |                                                                                                                |             |
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# IE-79-14 Inspection Data Sheet for Piping and Valves Final Page

| Inspection Package Computer ID.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |              |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| Final Acceptance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |              |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Inspection performed in accordance acceptable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | e with Rev.  | of WBNP-QC                            | P-4.56 and                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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WBNP-QCP-4.56 R6 Attachment C LOP

# IE-79-14 Inspection Data Sheet for Valves

| Inspection Package Computer ID.    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                       | 1. 19 数据 19 20 20 20 20 20 20 20 20 20 20 20 20 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| Manufacturers Identification No.   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Pipe Size and Material             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Valve Length                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Type of Valve End Connection       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Type of Operator                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | e e e e e e e e e e e e e e e e e e e |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Operator Manufacturer              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                       | A STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STA |
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| Overall Height of Valve (Operator) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Valve Installation                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| Remarks                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| Data Recorder:                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

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| Attachmen | t D     |          |
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| Page 1 of | 4       | A Berlin |
| Sheet     | of      |          |

# IE-79-14 Inspection Summary Data Sheet for Supports

|                                                 | 79-14 Inspection Summar           | y back sheet for      | supports                  |
|-------------------------------------------------|-----------------------------------|-----------------------|---------------------------|
| A SALING MANAGEMENT                             | age Computer ID.                  |                       |                           |
|                                                 | ing No. and Rev. r of SupportsNum |                       | naccacible and the second |
| 1996年中国 1996年1996年1996年1996年1996年1996年1996年1996 | dditional supports                |                       | in a comment              |
|                                                 | issing supports                   |                       |                           |
|                                                 | k Number and Applicable           | Diagram Trace         | king Number listed        |
| 4. Support Mar<br>Below:                        | k number and Applicable           | biscrepancy irac      | RING NUMBER LIBLES        |
| Mark No.                                        | Discrepancy No.                   | Mark No.              | Discrepancy No.           |
|                                                 |                                   |                       |                           |
|                                                 |                                   |                       |                           |
|                                                 |                                   |                       | 1                         |
|                                                 |                                   |                       |                           |
|                                                 |                                   |                       |                           |
| 5. Discrepanci                                  | es summarized into the            | following categor     | ies:                      |
| No. of Supp                                     | oort Location                     | No. of Sprin          | ıg Size                   |
| No. of Rest                                     | raint Direction _                 | No. of Cotte          | er Keys                   |
| No. of Supp                                     | port Type                         | No. of Compo          | onent                     |
|                                                 |                                   | Standard Sup<br>Sizes | pport                     |
| No. of Stru                                     | uctural Members/                  | No. of Lug S          | Size                      |
| Parts                                           |                                   |                       |                           |
| No. of Majo<br>Size/Length                      | or Structural Member<br>n         | No. of Clear          | rance                     |
| No. of Weld                                     | i _                               | No. of Dama           | ge                        |
| No. of Ancl                                     |                                   | No. of Addi           | tional                    |
|                                                 | ·                                 | Attachments           |                           |
| No. of Bol                                      | ted Connection(s)                 | No. of Misc           | ellaneous                 |
| No. of Snul                                     | bber Size/Setting                 |                       | •                         |

| WBNP | -QCP-4.56 | R6 | 187 |
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| Atta | chment D  |    |     |
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| Page | 2 of 4    |    |     |
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# IE-79-14 Inspection Summary Data Sheet for Supports

| Inspection Package Compu | iter ID.                                                       |                              |
|--------------------------|----------------------------------------------------------------|------------------------------|
| Inspection Drawing No. s | ind Rev.                                                       |                              |
|                          | liscrepancy data is recorded                                   |                              |
| Discrepancy tracking     | number, corrective action                                      | referencing attachment       |
| below. When the cor      | number and test level update rective action is complete        | and acceptable, the          |
| inspector initials a     | ind dates under the "accepts                                   | ble" column for the          |
|                          |                                                                |                              |
| Discrepancy No.          | Corrective Action                                              | Acceptable<br>Inspector/Date |
|                          |                                                                | Allapectory                  |
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# IE-79-14 Inspection Summary Data Sheet for Supports Continuation Page

| Inspection Drawing No. and Rev.  6. Continued  Discrepancy No. Corrective Action Acceptable Inspector/Date |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   | MULLINALI    |                                       |                                       |                          |               |
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| Discrepancy No.   Corrective Action   Acceptable   Inspector/Date                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   | A CONTRACTOR | Bury Hay June & State                 | ويتحري وأجعار العائر                  |                          |               |
| Inspector/Date                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   |              |                                       |                                       |                          |               |
|                                                                                                            | Discrepancy No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   | Correcti     | ve Action                             |                                       | Acceptabl<br>Inspector/D | e<br>ate      |
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|                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   |              |                                       | <del></del>                           |                          |               |
|                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | · |              | · · · · · · · · · · · · · · · · · · · | · · · · · · · · · · · · · · · · · · · |                          | <del></del> : |
|                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   | -            |                                       | - <u> </u>                            | -                        |               |
|                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   |              |                                       | <del>-</del>                          |                          | •.            |

| WBNP- | -QCP-4.56 R | <b>b</b> 416.2 |
|-------|-------------|----------------|
| Attac | hment D     |                |
| LOP   |             |                |
| Page  | 4 of 4      |                |
| Sheet | c of        | The Later      |

## IE-79-14 Inspection Summary Data Sheet for Suports

| Flyddin ya  | 别我们的 对的现在分词               | er ID.                       |   |
|-------------|---------------------------|------------------------------|---|
| . Continue  | rawing No. and i ancy No. | Corrective Action Acceptable |   |
|             |                           | Inspector/Dat                | e |
|             |                           |                              |   |
|             |                           |                              |   |
| 7. Final Ac | ceptance                  |                              |   |

WBNP-QCP-4.56 R6
Attachment E
LOP
Page 1 of 2
Sheet \_\_\_\_ of

## IE-79-14 Individual Support Inspection Data Sheet

| pection Package Computer ID.                                               |       |               |                                       |
|----------------------------------------------------------------------------|-------|---------------|---------------------------------------|
| pection Drawing No. and Rev.                                               |       |               |                                       |
| port Identifier (WBRF-QCI-1.40)                                            |       |               |                                       |
| crepancy Tracking No.                                                      |       |               |                                       |
| Support Inspection Checklist                                               |       |               |                                       |
| Support Relative Location Correct:  Restraint Installed Direction Correct: |       | No No         |                                       |
| upport Type Correct:                                                       |       | No            |                                       |
| uctural Members/Parts Installed:                                           | :3, 1 | No            | -<br>enath                            |
| or Structural Member Size/Length: cified Welds made:                       | 1.    | No            | - ""                                  |
| or Bolts Installed:                                                        |       | No            |                                       |
| d Connections Acceptable: er Size/Setting Correct:                         |       | No            |                                       |
| g Can Size Correct:                                                        | Yes   | No            | N/A                                   |
| er Keys Installed:                                                         | Yes   | No            | _ N/A                                 |
| ponent Standard Support Sizes Correct:                                     | Yes   | No            | _ N/A                                 |
|                                                                            |       | No            |                                       |
| rances Correct:                                                            | Yes   | No            | _ N/A                                 |
| rd Actual Clearance: Vertical: Top                                         |       | in., Bottom _ | in.                                   |
| il: in., Lateral: Total Gap                                                | _ in. |               |                                       |
| ort Damaged:                                                               | Yes   | No            | · · · · · · · · · · · · · · · · · · · |
| ditional Attachments(s) To Support:                                        | Yes   | No            | N/A                                   |
| scellaneous (Describe):                                                    |       |               |                                       |

| WBNP- | -QCP-4.56 I | 16 |
|-------|-------------|----|
| Attac | chment E    |    |
| LOP   |             |    |
| Page  | 2 of 2      |    |
| Sheet | t of        |    |

| IE-79-14 | Individual | Support | Inspection | Data | Sheet |
|----------|------------|---------|------------|------|-------|
| • .      | ·.         |         | . •        |      |       |

|                         | 1000 (1000)<br>244 (1600) |                                                                                                                                        | Sheet of              |
|-------------------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
|                         |                           | IE-79-14 Individual Support Inspection                                                                                                 |                       |
|                         |                           |                                                                                                                                        | Vala bleet            |
|                         | Ins                       | pection Package Computer ID.                                                                                                           |                       |
|                         | Ins                       | pection Drawing No. and Rev.                                                                                                           |                       |
|                         | Sup                       | port Identifier (WBNP-QCI-1.40)                                                                                                        |                       |
|                         | Dis                       | crepancy Tracking No.                                                                                                                  |                       |
|                         | 2.                        | Describe below each discrepant condition on thi                                                                                        | 8 Support.            |
|                         |                           |                                                                                                                                        |                       |
|                         |                           |                                                                                                                                        |                       |
|                         |                           |                                                                                                                                        |                       |
|                         |                           |                                                                                                                                        |                       |
|                         |                           |                                                                                                                                        |                       |
|                         | in si<br>An in i          |                                                                                                                                        |                       |
|                         | 3.                        | Describe below corrective action required to recondition. Specify inspection test number(s) a requirements for the support identifier. | and test level update |
| ege files stand growers |                           |                                                                                                                                        |                       |
|                         |                           |                                                                                                                                        |                       |
|                         | ·                         |                                                                                                                                        |                       |
|                         | . '                       |                                                                                                                                        | •                     |
|                         |                           |                                                                                                                                        |                       |
|                         |                           |                                                                                                                                        |                       |
|                         |                           |                                                                                                                                        | Paka                  |
|                         |                           |                                                                                                                                        | gineer Date           |
|                         | 4.                        | Corrective Action Complete and Acceptable.                                                                                             |                       |
|                         | 1 1 2                     |                                                                                                                                        |                       |
|                         |                           | Inc                                                                                                                                    | spector Date          |
|                         | 5.                        | Final Acceptance                                                                                                                       |                       |
| 2                       |                           | Inspection performed in accordance with Rev was acceptable.                                                                            | of WBNP-QCP-4.56 and  |
|                         |                           | Inspector Date                                                                                                                         |                       |
|                         |                           |                                                                                                                                        | <del></del>           |

#### **EVALUATION SHEET**

Rev. R2 Date  $\frac{R2}{1/24/84}$ 

1. Task Force Category 9 for Watts Bar Nuclear Plant - Unit 1

2. Task Force Category Description and Related B&V Findings:

Failure to adequately control and evaluate embedded plate capacity when multiple attachments were made to the plate by Construction: F506, F710, F711, F712, F713, F724R1, F730R1, F731R1

- 3. Evaluation for Cause
  - A. Preliminary
    - EN DES procedures did not control or address the addition of attachments to embedded plates by Construction.
    - Installation requirements and acceptance criteria on design output documents were not adequate (construction specifications and drawings).
  - B. Final

Same as Preliminary.

Resp. Org. WBP 7/20/83 Task Force Concurrence Holling 7/20/83

- 4. Evaluation for Generic Examples
  - A. Preliminary

This finding applies to all embedded plates.

B. Final

Same as Preliminary.

Resp. Org. WBP 7/20/83 Task Force Concurrence 720/83

| 5. | Licens | ing | Basis | Satis | sfac | tion |
|----|--------|-----|-------|-------|------|------|
|----|--------|-----|-------|-------|------|------|

- A. Preliminary
  Licensing basis is satisfied thus far since the B&V findings and the sampling
  program performed to date has not identified any examples of embedded
  plates where failure would occur. Until the sampling program is
  completed, a potential exists for the licensing basis not being satisfied.
- B. Final

Licensing basis is satisfied since neither the B&V findings nor the sampling program identified any plates in the sample that were structurally inadequate.

|    |            |           | 1/31/84   |           |       | I home      | 1/31/84  |
|----|------------|-----------|-----------|-----------|-------|-------------|----------|
|    | Resp. Org. | WBP       | 7120/83 A | J<br>Task | Force | Concurrence | -7/20/83 |
| AJ |            | A. tonsom |           |           |       |             |          |

- 6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work
  - A. Preliminary
    The corrective action for NCR WBN CEB 8203 is a sample of 69 embedded plates
    to evaluate if a failure would occur in a worst case situation. Based on the
    results of the sample, further corrective action may be required. This approach
    is adequate.
  - B. Final

The corrective action for NCR WBNCEB8203 to sample 69 embedded plates was completed. No further corrective action is required.

| 0.1 | Resp. | Org. | WBP     | 7/20/83 | Task | Force | Concurrence Iffer | 7 R=183 |
|-----|-------|------|---------|---------|------|-------|-------------------|---------|
| A - |       |      | A. tons | $\sim$  |      |       |                   |         |

- 7A. Identification of Corrective Action for Completed Work
  - A. Preliminary

The plan in 6AA appears to be adequate.

B. Final

Identification of corrective action for completed work is not required as all 69 sampled embedded plates were found to be structurally adequate.

Resp. Org. WBP 7/20/83 Task Force Concurrence 7/83

| 8A.  | Imp  | lementation and Inspection of Corrective Action for Completed Work                                                                                                                                                                                                                                                                                                               |
|------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | A.   | Preliminary                                                                                                                                                                                                                                                                                                                                                                      |
|      |      |                                                                                                                                                                                                                                                                                                                                                                                  |
|      |      |                                                                                                                                                                                                                                                                                                                                                                                  |
|      |      |                                                                                                                                                                                                                                                                                                                                                                                  |
|      | в.   | Final                                                                                                                                                                                                                                                                                                                                                                            |
|      |      | No corrective action for completed work is required as all 69 sampled embedded plates were found to be structurally adequate.                                                                                                                                                                                                                                                    |
|      |      |                                                                                                                                                                                                                                                                                                                                                                                  |
| 47   | Res  | p. Org. WBP 7/20/83 Task Force Concurrence Herry 7/20/83                                                                                                                                                                                                                                                                                                                         |
| 9A.  | Ide  | ntification and Evaluation of Ongoing Corrective Action for Future Work                                                                                                                                                                                                                                                                                                          |
|      | В.   | Preliminary Construction Specification for Watts Bar Nuclear Plant N3C-928, "Locating Attachments on Embedded Plates," provides requirements to Construction for locating attachments on embedded plates. Hanger drawings should reference this construction specification as required. This plan appears to be adequate. Final Corrective action as described in A is adequate. |
|      | Resi | p. Org. WBP 7/20/83 Task Force Concurrence 24 83                                                                                                                                                                                                                                                                                                                                 |
| .0A. | Ide  | ntification of Corrective Action for Future Work                                                                                                                                                                                                                                                                                                                                 |
|      | A.   | Preliminary                                                                                                                                                                                                                                                                                                                                                                      |
|      |      | Plan in 9AA appears adequate.                                                                                                                                                                                                                                                                                                                                                    |
|      |      |                                                                                                                                                                                                                                                                                                                                                                                  |
|      | В.   | Final                                                                                                                                                                                                                                                                                                                                                                            |
|      |      | Plan in 9A is adequate.                                                                                                                                                                                                                                                                                                                                                          |

Resp. Org. WBP 7/20/83 Task Force Concurrence 7/2483

A tonsom

|     | A. Preliminary                                                                                                                                                                                                                                                                                                                                           |                             |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
|     |                                                                                                                                                                                                                                                                                                                                                          | ·                           |
|     |                                                                                                                                                                                                                                                                                                                                                          |                             |
|     |                                                                                                                                                                                                                                                                                                                                                          |                             |
|     | B. Final                                                                                                                                                                                                                                                                                                                                                 | ÷.                          |
|     | b. rinal                                                                                                                                                                                                                                                                                                                                                 |                             |
|     | Appendix No. 4 to EN DES-EP 4.03 "Field Change Requests" proinstructions for handling field change requests on multiple to embedded plates. This EN DES EP together with Construct N3C-928 will ensure adequate resolution of this category.                                                                                                             | attachments                 |
|     |                                                                                                                                                                                                                                                                                                                                                          | ·                           |
|     | Resp. Org. A tourson 12/7/83 Task Force Concurrence                                                                                                                                                                                                                                                                                                      | hom 12/5/83                 |
| 2A. | Verification of Effectiveness of Corrective Action for Future Wo                                                                                                                                                                                                                                                                                         | ork                         |
|     | A. Preliminary                                                                                                                                                                                                                                                                                                                                           |                             |
|     |                                                                                                                                                                                                                                                                                                                                                          |                             |
|     |                                                                                                                                                                                                                                                                                                                                                          |                             |
|     |                                                                                                                                                                                                                                                                                                                                                          |                             |
|     |                                                                                                                                                                                                                                                                                                                                                          |                             |
|     | P. Final                                                                                                                                                                                                                                                                                                                                                 |                             |
|     | B. Final  The basis for OMS electron of this extractor analystics where it                                                                                                                                                                                                                                                                               |                             |
|     | B. Final  The basis for QMS closure of this category evaluation sheet is J. W. von Weisenstein's memorandum to Quality Management Staf November 16, 1984 (QMS 841116 202).                                                                                                                                                                               | s noted in<br>f Files dated |
|     | The basis for QMS closure of this category evaluation sheet is J. W. von Weisenstein's memorandum to Quality Management Staf                                                                                                                                                                                                                             | s noted in<br>f Files dated |
|     | The basis for QMS closure of this category evaluation sheet is J. W. von Weisenstein's memorandum to Quality Management Staff November 16, 1984 (QMS 841116 202).  Resp Org. Task Force Concurrence                                                                                                                                                      | f Files dated               |
| 6B. | The basis for QMS closure of this category evaluation sheet is J. W. von Weisenstein's memorandum to Quality Management Staf November 16, 1984 (QMS 841116 202).                                                                                                                                                                                         | f Files dated               |
| 6B. | The basis for QMS closure of this category evaluation sheet is J. W. von Weisenstein's memorandum to Quality Management Staff November 16, 1984 (QMS 841116 202).  Resp Org. Task Force Concurrence                                                                                                                                                      | f Files dated               |
| 6B. | The basis for QMS closure of this category evaluation sheet is J. W. von Weisenstein's memorandum to Quality Management Staf November 16, 1984 (QMS 841116 202).  Resp Org. Task Force Concurrence Identification and Evaluation of Ongoing Corrective Action for Concurrence Identification and Evaluation of Ongoing Corrective Action for Concurrence | f Files dated               |
| 6B. | The basis for QMS closure of this category evaluation sheet is J. W. von Weisenstein's memorandum to Quality Management Staff November 16, 1984 (QMS 841116 202).  Resp Org. Task Force Concurrence Identification and Evaluation of Ongoing Corrective Action for CA. Preliminary                                                                       | f Files dated               |
| 6в. | The basis for QMS closure of this category evaluation sheet is J. W. von Weisenstein's memorandum to Quality Management Staff November 16, 1984 (QMS 841116 202).  Resp Org. Task Force Concurrence Identification and Evaluation of Ongoing Corrective Action for CA. Preliminary                                                                       | f Files dated               |
| 6В. | The basis for QMS closure of this category evaluation sheet is J. W. von Weisenstein's memorandum to Quality Management Staff November 16, 1984 (QMS 841116 202).  Resp Org. Amad Line To Task Force Concurrence To Task Force Concurrence To Concurrence Action for Concurrence Action for Concurrence N/A                                              | f Files dated               |
| 6B. | The basis for QMS closure of this category evaluation sheet is J. W. von Weisenstein's memorandum to Quality Management Staff November 16, 1984 (QMS 841116 202).  Resp Org. Task Force Concurrence Identification and Evaluation of Ongoing Corrective Action for CA. Preliminary                                                                       | f Files dated               |
| 6B. | The basis for QMS closure of this category evaluation sheet is J. W. von Weisenstein's memorandum to Quality Management Staff November 16, 1984 (QMS 841116 202).  Resp Org. Amad Line To Task Force Concurrence To Task Force Concurrence To Concurrence Action for Concurrence Action for Concurrence N/A                                              | f Files dated               |
| 6B. | The basis for QMS closure of this category evaluation sheet is J. W. von Weisenstein's memorandum to Quality Management Staff November 16, 1984 (QMS 841116 202).  Resp Org. Amad Line To Task Force Concurrence To Task Force Concurrence To Concurrence Action for Concurrence Action for Concurrence N/A                                              | f Files dated               |

11A. Implementation of Corrective Action for Future Work

| 7B. | Ide | ntification of | Correct   | ive Acti | on for Co | mpleted   | Work         |            |      |
|-----|-----|----------------|-----------|----------|-----------|-----------|--------------|------------|------|
|     | A.  | Preliminary    | •         |          |           |           |              | •          |      |
|     |     | N/A            |           |          |           |           |              |            |      |
|     |     |                |           |          |           |           |              |            |      |
|     |     |                |           |          |           |           |              |            |      |
|     | В.  | Final          |           |          |           |           |              |            |      |
|     |     |                |           |          | •         |           |              |            |      |
|     |     |                |           |          |           | ,         | ~            |            |      |
|     | Dog | . 0            |           | , ,      |           |           |              |            |      |
|     | res | p. Org         |           |          | _ Task F  | orce Con  | currence     |            |      |
| 8B. | Imp | lementation ar | nd Insped | ction of | Correctiv | ve Action | for Comple   | ted Work   |      |
|     |     | Preliminary    |           |          |           |           |              |            |      |
|     |     | N/A            |           |          | -         |           |              |            |      |
|     |     |                |           |          | •         |           |              |            |      |
|     |     |                |           |          |           |           |              |            | •    |
|     | В.  | Final          |           |          |           |           |              |            |      |
| )   |     |                |           |          |           |           |              |            |      |
|     |     |                | -         |          |           |           |              |            |      |
|     |     |                |           |          |           | ٠         |              |            |      |
|     | Res | p. Org         |           | 1 .1     | _ Task H  | Force Con | currence _   |            | / /  |
| 9B. | Ide | ntification an | nd Evalu  | ation of | Ongoing   | Correctiv | ze Action fo | r Future V | lork |
| ,,, | A.  | Preliminary    | id bvald  | acion oi | ongoing ( | 30110011  | e neeron ro  | ratare,    | 101K |
|     | Α.  |                |           |          |           |           |              |            |      |
|     |     | N/A            |           |          |           |           |              |            |      |
|     |     |                | · .:      |          |           |           |              |            |      |
|     | В.  | Final          |           |          |           |           |              |            |      |
|     |     |                |           |          |           |           |              |            |      |
|     |     |                |           |          |           |           |              |            |      |
|     |     |                |           |          |           |           |              |            |      |
|     |     |                |           |          |           |           |              |            |      |

| A. Preliminar     | ·y              |              |                |            | •        |     |  |
|-------------------|-----------------|--------------|----------------|------------|----------|-----|--|
| N/A               |                 |              |                |            | ••       |     |  |
|                   |                 |              |                |            |          | •   |  |
|                   | •               |              |                |            |          |     |  |
| B. Final          |                 |              | <u>.</u>       |            |          |     |  |
|                   |                 |              |                |            |          |     |  |
|                   |                 | ,            | •              |            |          |     |  |
|                   |                 |              |                |            |          |     |  |
| Resp. Org.        |                 | Task         | Force Concurr  | ence       |          | / / |  |
| P. Toplomentation |                 | A            | T              |            | <u> </u> |     |  |
| B. Implementation |                 | Action for   | ruture work    |            |          |     |  |
| A. Prelimina      | cy .            |              |                |            |          |     |  |
| N/A               |                 | •            |                | •          |          |     |  |
|                   |                 |              |                |            |          |     |  |
| p n:1             |                 |              |                |            |          | -   |  |
| B. Final          |                 |              | -              |            |          |     |  |
| κ.                |                 |              |                |            |          |     |  |
|                   |                 | •            |                |            |          |     |  |
| Resp. Org.        | . /             | / Task       | Force Concurr  | ence       |          | / / |  |
|                   |                 |              |                |            |          |     |  |
| B. Verification   | of Effectivenes | s of Correct | ive Action for | Future Wor | rk       |     |  |
| A. Prelimina      | ry              |              |                |            | - *      |     |  |
| N/A               |                 |              |                |            |          |     |  |
| * .               |                 |              | ,              |            |          |     |  |
|                   | ·               |              |                |            |          |     |  |
| B. Final          |                 |              |                |            |          |     |  |
|                   |                 |              |                |            |          | *   |  |
|                   |                 |              |                |            |          |     |  |
|                   |                 |              |                | -<br>•     |          |     |  |
|                   |                 |              |                | •          |          |     |  |

10B. Identification of Corrective Action for Future Work

TVA 64 (08-9-65)

UNITED STATES GOVERNMENT

### Memorandum

TENNESSEE VALLEY AUTHORITY

OMS

'841116 202

TO

Quality Management Staff Files

FROM

J. W. von Weisenstein, 384 SPB-K

84112980351

DATE : NOV 1 () 1984

SUBJECT:

ASSESSMENT OF ADROUACY OF CORRECTIVE ACTION FOR FUTURE WORK FOR BLACK AND

VEATCH TASK FORCE CATEGORY 9

For this category, the TVA task force for review of Black and Veatch findings determined that the condition was applicable to Watts Bar units 1 and 2 and that corrective action was not required for completed work, but was required for future work. The TVA task force decision that no corrective action was required for completed work was based on the results of a sample of 69 embedded plates which were found to be structurally adequate.

In the interest of in pendently confirming the decision that no corrective action was required for completed work, QMS performed a surveillance in accordance with the attached scoping document which treated the work associated with the sample as corrective action for completed work. The results of that surveillance, contained in the attached surveillance report, verified the adequacy of the corrective action implementation and effectiveness for future work. However, a concern was identified in the attached report affecting the implementation and effectiveness of corrective action for future work. That concern relates to a deviation from the requirements of EP 3.04, section 3.1, and the proper referencing of construction specification N3C-928 on the appropriate construction and installation drawing. This deviation has been documented on NCR WBNQMS8401 thus permitting closure of this category.

Based upon our assessment of category 9, we conclude that this category can be closed by signing and dating item 12A, "Verification of Effectiveness of Corrective Action for Future Work."

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QUALITY MANAGEMENT STAFF
SURVEILLANCE REPORT FOR THE ASSESSMENT
OF THE EFFECTIVENESS OF CORRECTIVE ACTIONS
IDENTIFIED IN THE TASK FORCE REPORT ON THE
BLACK AND VEATCH FINDINGS

PLANT: Watts Bar Nuclear Plant Units 1 and 2
CATEGORY: 9

Prepared By: Sand Puku Approved By: Date:

Concerns: NO  $/\overline{X}$  / Yes  $/\overline{\phantom{X}}$  / (if yes, identify below) Results:

I. Management Summary: The design processes evaluated are outlined in the attached surveillance scoping document, and they comply with requirements except in the area of project construction specification N3C-928 properly being referenced on construction drawings which deviate from EP 3.04 requirements.

NCR WBNQMS8401 identifies a deviation from the requirements of EP 3.04, section 3.1, and OE-WBEP properly referencing construction specification N3C-928 on the appropriate construction or installation drawing. This deviation affects implementation and effectiveness of corrective action for future work.

II. Conclusions and Recommendations: Based upon the results of this surveillance, the corrective action for completed work was found to be effective. In addition, the corrective action for future work was also found to be effective although the OE-WBEP does not properly reference construction specification N3C-928 in applicable construction drawings. This conclusion was reached as a result of the completion of an evaluation of the change control design process (FCRs) involving attachments to embedded plates.

#### III. Details:

- A. Performed the following surveillance activities to verify corrective action implementation for completed work:
  - Verify the results of the sampling program by sampling one of the 69 embedded plates evaluated.

Results: Reviewed the calculations for attachments to embedded plate mark No. MK61C. This calculation covered pages 17-51C of a 356-page package (SWP 830214 024). Drawing 48N1213-1 covers this plate. The approach used to determine loads on these embedded plates appears to be adequate.

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