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) Docket Nos. 50-390
Tennessee Valley Authority) 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

J. A. Domer, Chief
Nuclear Licensing Branch

2nd Dist

Sworn to and subscribed before me
this 21st day of June 1985

Paulette D. White
Notary Public
My Commission Expires 8-24-88

5 Encl's Rec'd 7/5/85
A001 1/5 Add: 4th Encl
NSIC 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

B001
1/1

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

WBNEEB8104
WBNCEB8204
WBNEEB8208
GENCEB8213
WBNCEB8215
WBNCEB8222R1
WBNCEB8232
WBNSWP8252R3
WBNSWP8262
WBNSWP8272
WBNSWP8273
GENNEB8301
WBNSWP8301
GENCEB8302
WBNSWP8305
WBNSWP8309
WBNSWP8312
WBNEEB8401

Engineering Change Notices

2576
3198
3210
3306
3507
3511
3636

Field Change Notices

H-7597
H-7618
H-8083
H-8236
H-8404
H-8721

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.

TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

June 21, 1985

7/5/85 TI
7/31/85 TI - 2nd Request 7/5/85 Misplaced By Contractor

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	)	Docket Nos. 50-390
Tennessee Valley Authority	)	50-391

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Very truly yours,

TENNESSEE VALLEY AUTHORITY

J. A. Domer

J. A. Domer, Chief
Nuclear Licensing Branch

"2nd Dist"

Sworn to and subscribed before me
this 21st day of June 1985
Paulette H. White
Notary Public
My Commission Expires 8-24-88

4 Encl's Rec'd 7/5/85
H001 1/5 Add: 4 Encl
NSIC 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

H001 1/1

H001 1/1

ENCLOSURE
WATTS BAR NUCLEAR PLANT
RESPONSE TO QUESTIONS OF THE MAY 30, 1985,
NRC REQUEST FOR ADDITIONAL INFORMATION
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WBNCEB8232
WBNSWP8252R3
WBNSWP8262
WBNSWP8272
WBNSWP8273
GENNEB8301
WBNSWP8301
GENCEB8302
WBNSWP8305
WBNSWP8309
WBNSWP8312
WBNEEB8401

Engineering Change Notices

2576
3198
3210
3306
3507
3511
3636

Field Change Notices

H-7597
H-7618
H-8083
H-8236
H-8404
H-8721

Commitment Tracking Records

WBN-R189
WBN-R190
WBN-R266

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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

TVA 54 (05-9-65)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

OEDC 82-

EDC '82 1007 005

EGB
JPK
REW KEW
SD 10
GMT
AH

TO : Those listed

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

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)

Date: OCT 7 1982

WTB
BTV

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.

Those listed
October 7, 1982

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

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.

G. H. Kimmons

J. W. Anderson, 902 HBB-K
E. G. Beasley, W12B26 C-K
H. N. Culver, 249A HBB-K
H. H. Mull, E7B24 C-K
R. M. Pierce, 104 ESTA-K
M. N. Sprouse, W11A9 C-K

cc: G. F. Dilworth, E12D46 C-K
H. G. Parris, 500A CUBB-C
MEDS, W5B63 C-K

TVA 64 (OS-9-65)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

CAM 821 001

TO : OEDC QA Files

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

DATE : November 3, 1982

SUBJECT: WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW POLICY COMMITTEE

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, 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.

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.

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:

- 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.

- 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.

- 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
November 2, 1982

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 emphasized that the field review should be completed on site on schedule on November 3 and in EN DES on November 5.

E. Gray Beasley

EGB:AH

cc: J. W. Anderson, 902 HBB-K
H. N. Culver, 249A HBB-K
G. H. Kimmons, W12A9 C-K
H. L. Jones, W10A17 C-K
MEDS, W5B63 C-K
H. H. Mull, E7B24 C-K
R. M. Pierce, 104 ESTA-K
M. N. Sprouse, W11A9 C-K

TVA 64 (08-9-65)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

EDC 821206 010

TO : OEDC MO Files

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

Reference: G. H. Kimmons' memorandum to Those listed dated October 7, 1982 (EDC 821107 005).

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

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.

On findings where installation, inspection and documentation are not 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.

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 indicatd 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.

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
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M. N. Sprouse, W11A9 C-K

POLICY COMMITTEE
BLACK AND VEATCH - INDEPENDENT REVIEW OF WATTS BAR NUCLEAR PLANT
DECEMBER 2, 1982 - MEETING AGENDA

I. Status of Review

427 Level 1 Findings
161 Level 1 Responses
134 Level 2 (37 o's, 69 r's, 28 c's)
75 Level 2 Responses
0 Level 3

II. Where We Are in Technical Disagreement

III. Level 1 Responses to Minor Consequence Findings

IV. Conditions Adverse to Quality

V. Catagory of Findings

Open
Resolved
Confined

VI. Tracking of Items Where OEDC Has Action

VII. Schedule

(FN) 12/02/82, 11:00 a.m.

Review of Watts Bar - Black & Veatch Findings

No.	Level 1 Received	Response Received	Level 2 Received	Response Returned	Comments* Type	Comments* Category	C/A Required	C/A Identification	Responsible Person
F100	10/28/82	10/29/82	11/1/82	11/8/82	R	A	Yes	add to 6 bldgs mon.	L. T. Perry
F101	10/28/82				O	A			E. H. Cole
F102	10/28/82				O	A			E. H. Cole
F103	10/28/82				O	A			E. H. Cole
F104	10/28/82	11/3/82	11/19/82	11/22/82	R	A	Yes	drawing change	E. H. Cole
F105	10/28/82				O	A			E. H. Cole
F106	10/28/82	11/3/82	11/19/82	11/22/82	R	A	Yes	drawing change	E. H. Cole
F107	10/28/82				O	A			E. H. Cole
F108	10/28/82				O	A			E. H. Cole
F109	10/28/82	11/17/82			O	A			E. H. Cole
F110	10/28/82				O	A			E. H. Cole
F111	10/28/82	11/3/82	11/19/82	11/22/83	R	B	Yes	drawing change	E. H. Cole
F112	10/28/82				O	A			E. H. Cole
F113	10/28/82				O	A			E. H. Cole
F114	10/28/82				O	A			E. H. Cole
F115	10/28/82	11/3/82	11/19/82	11/22/82	O	A	Yes	drawing change	E. H. Cole
F116	10/29/82				O	A			E. H. Cole
F117	10/29/82				O	A			E. H. Cole
F118	10/29/82				O	A			E. H. Cole
F119	10/29/82	11/1/82	11/3/82	11/29/82	O	B	Yes	FSAR change	L. T. Perry/L. T. Perry
F120	10/30/82	11/17/82			O	A			E. H. Cole
F121	10/29/82	11/2/82			O	A	No		L. T. Perry
F122	10/29/82				O	A			E. H. Cole
F123	10/29/82				O	A			E. H. Cole

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

TVA 64 (C.)-9-65)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

EDC 821228 402

TO : OEDC MO Files

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

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 OF 12/17/82:

TOTAL NUMBER FINDINGS	LEVEL 1 RESPONSE	RECEIVED FROM B&V FOR LEVEL 2 REVIEW	LEVEL 2 RESPONSE
428	264	202	149
		124 RESOLVED	
		38 OPEN	
		40 CONFIRMED	

ELECIRICAL/CONTROL	45	(10.5%)
MECHANICAL	75	(17.5%)
SIRUCTURAL	14	(3.3%)
FIELD	294	(68.7%)
TOTAL	428	

TVA 64 (CS-9-65)

UNITED STATES GOVERNMENT

Memorandum

OQA 821210 300

TENNESSEE VALLEY AUTHORITY

TO : M. Kidd, Program Management Group Head, 301 HBB-K
H. Jones, Project Manager, WBN Independent Review, W10A17 C-K

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

DATE : December 10, 1982

SUBJECT: WBN INDEPENDENT REVIEW

I selected a random sample of 18 Black & Veatch (B&V) findings on the WBN AFW system which had their categories changed from "O" to "R" subsequent to OEDC feedback. My review of the paperwork indicated that 6 of these 18 should have remained "O" as asterisked below:

*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)

- o Quality achievement in construction. Inspection is only one element of quality assurance. Our program has not worked if the item is constructed so as to not meet design requirements. (F-777)

I recommend that OEDC pay close attention to all Rs and when appropriate continue to characterize them as valid findings.

From my conversations with you on December 8 and 9, I believe my concern is shared by and will be pursued by you. I plan to followup this concern after the issuance of the next level TVA response to B&V.

J. A. McDonald

JAM:VCT
cc: MEDS, W5B63 C-K

TVA 64 (CS-9 85)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

EDC 821228 402

TO : OEDC MO Files

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.

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OEDC MO Files
December 28, 1982

WATTS BAR NUCLEAR PLANT - INDEPENDENT REVIEW POLICY COMMITTEE

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E. Gray Beasley

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EGB:WBW
Attachments
cc (Attachments):
J. W. Anderson, 902 HBB-K
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TVA 64 (CS-9-65)

UNITED STATES GOVERNMENT

Memorandum

OQA 821210 300

TENNESSEE VALLEY AUTHORITY

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C. A. McDonald

J. A. McDonald

JAM:VCT
cc: MEDS, W5B63 C-K

FORM 2

WATTS BAR NUCLEAR PLANT
INDEPENDENT REVIEW

FINDING RESPONSE

Finding number IF 1510141

Date finding received from Black & Veatch _____
Date

Comments pertinent to finding:

Agree that this finding identifies a failure to meet a direct FSAR commitment.

Bellefonte containment analyses used 5% eccentricity. Review of the Bellefonte analyses has shown the effect of not using 5% eccentricity on Watts Bar to be small.

The deficiency has been identified as an NCR.

_____ _____
Chairman, OEDC Policy Committee Date

_____ _____
OEDC Program Manager Date

Date finding response transmitted to Black & Veatch _____
Date

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 actual 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

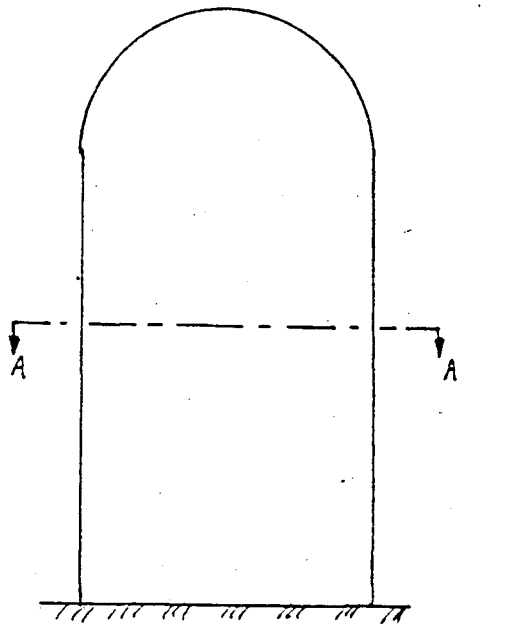
1. The FSAR commitment was not met.

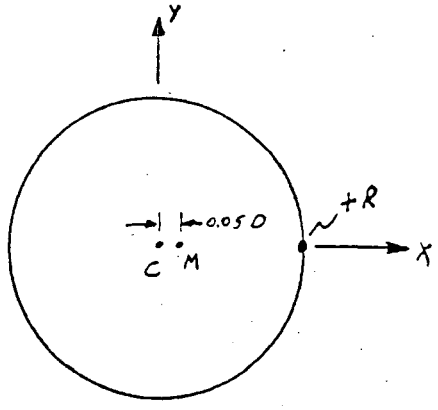
2. The original intent of the FSAR commitment was met.

3. The effect of not meeting the FSAR commitment is minimal.

COMPUTED KRS DATE 12-[illegible]-8

CHECKED DATE





Section A-A

Figure 1

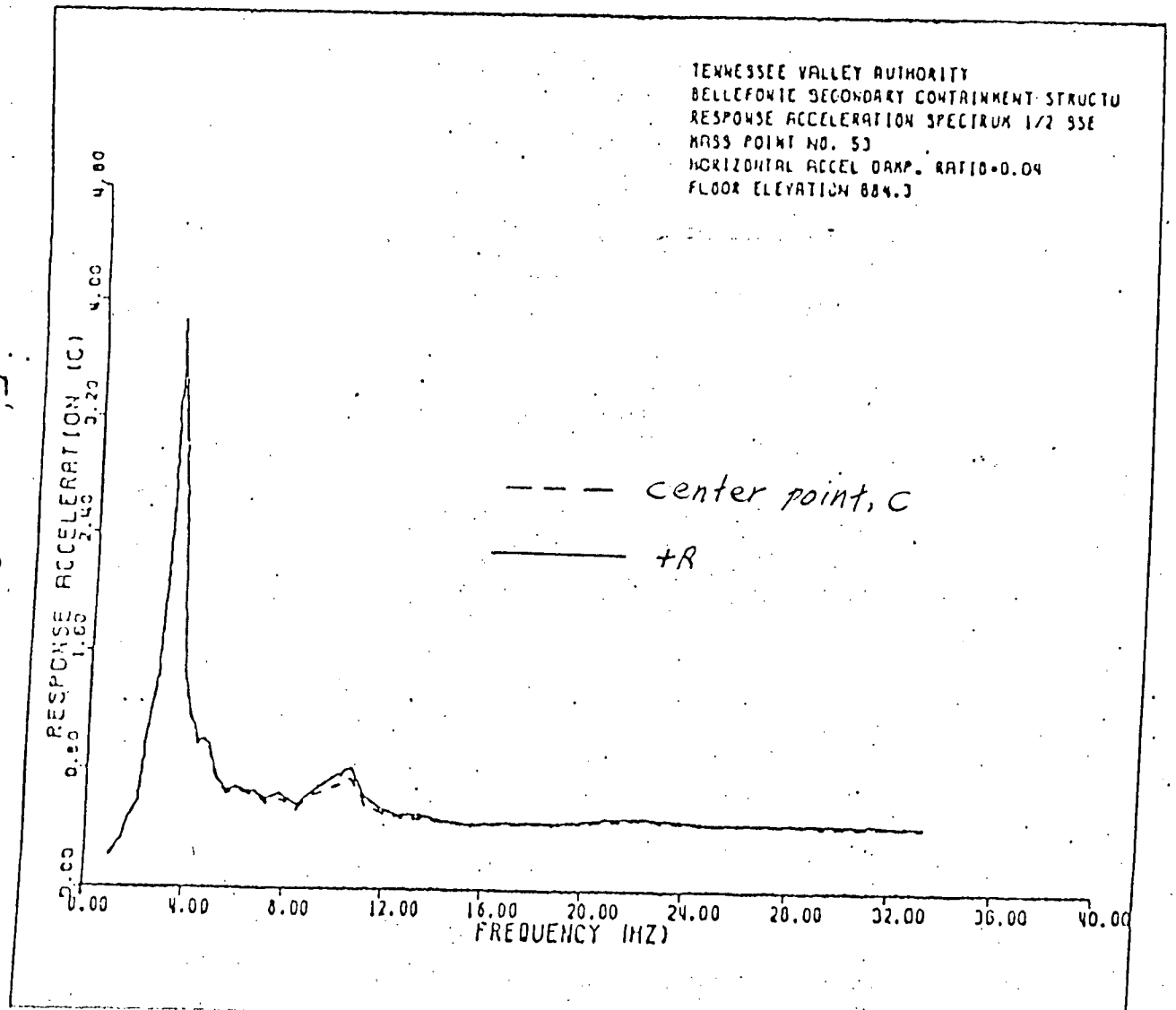

TENNESSEE VALLEY AUTHORITY
BELLEFONTE SECONDARY CONTAINMENT STRUCTU
RESPONSE ACCELERATION SPECTRUM 1/2 SSE
MASS POINT NO. 53
HORIZONTAL ACCEL DAMP. RATIO=0.04
FLOOR ELEVATION 884.3
RESPONSE ACCELERATION (G)
0.00
0.80
1.60
2.40
3.20
4.00
4.80
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
36.00
40.00
FREQUENCY (HZ)
--- center point, C
——— +R

Figure 2

FORM 2

WATTS BAR NUCLEAR PLANT
INDEPENDENT REVIEW

FINDING RESPONSE

Finding number IF1510171

Date finding received from Black & Veatch _____
Date

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.

E Gray Beasley
Chairman, OEDC Policy Committee

12-6-92
Date

_____
OEDC Program Manager

_____
Date

Date finding response transmitted to Black & Veatch _____
Date

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 verificaton 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 cxhanges 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

TVA 64 (OS-9-65)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

EDC 830901 401

TO : OEDC MO Files

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.

Post Meeting Note: 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 66 (08-9-80)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

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
W. R. Brown, 102 ESTA-K - Please arrange for assistance to the task force for determining applicability to Bellefonte.
H. N. Culver, 249A HBB-K
G. H. Kimmons, W12A9 C-K
MEDS, W5B63 C-K
R. M. Pierce, 104 ESTA-K
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 and tracking over the implementation of the evaluation process.

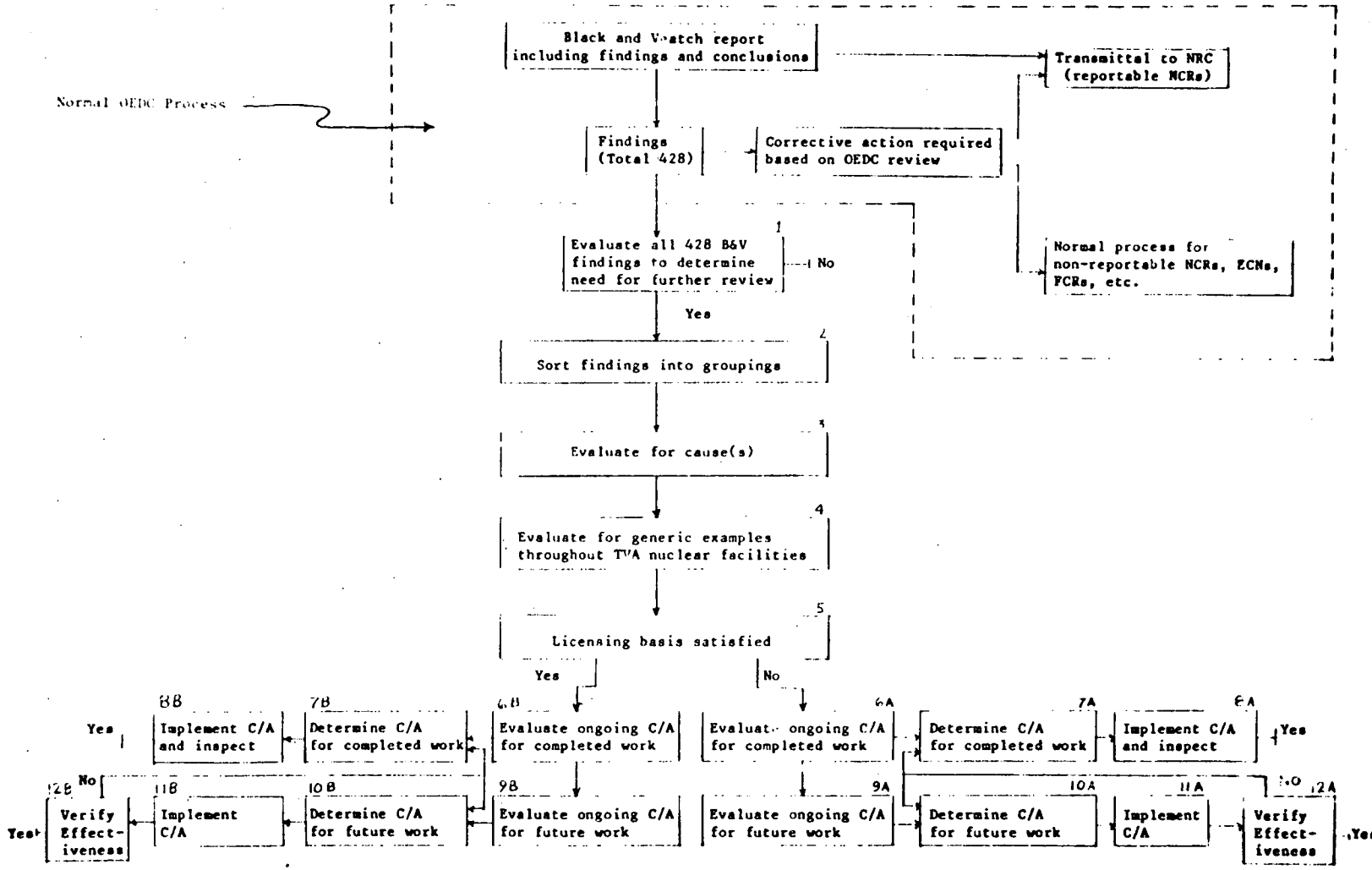
d. Designate and cause retention of appropriate records of the evaluation process.

e. Factor the results of the response to B&V findings with other systematic 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

ATTACHMENT 2



E63054.03

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.

3. 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

NOTES:

1. Findings which do not require evaluation for determination of corrective action.

1(1) 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 commitments.

Examples:

F134 - Lack of test data for flame test of cable. TVA subsequently provided B&V with existing cable flame test results.

F302 - TPIPE computer program not described in FSAR. TVA subsequently provided B&V with existing licensing submittal letter to NRC.

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.

Examples:

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-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 another appropriate category.

Examples:

F108 - Red indicating light for valve thermal overload bypass does not verify operation of relays K1 through K6. OEDC position - circuit design was reviewed by NRC and approved in SER.

F137 - Trip setting for electrical breaker not in accordance with manufacturer's recommendation. OEDC position - settings are in accordance with manufactuer's recommendations.

2. This category has been eliminated and all findings placed in other categories.

3. Logic/control drawings do not agree with electrical drawings - NCR WBNSWP8267.

4. Failure to design/maintain design records as specifically described in FSAR-GENCEB8213, GENNEB8301, GENCEB8215, WBNCEB8206.

5. Procurement data sheets and action diagrams for PCVs, LCVs, and check valves specified less than design requirements - ECN 3511, WBNNEB8207.

6. Deviations in translating support computer analysis results to load tables and then to support deigns - WBNCEB8232, WBNCEB8233, WBNSWP8272, WBNSWP8305, WBNSWP8309, WBNSWP8312, ECN 3511, ECN 3198.

7. Nonconforming conditions of construction of previously inspected and accepted pipe supports - NCR 4454R (R1), NCR 4455R (R0), NCR 4486R (R0), NCR 4535R (R0), NCR 4481R (R0), NCR 4478R (R0), NCR 4480R (R0), WBNSWP8307, NCR 4164R.

8. This item has been reassigned to Note 4.

9. Excessive loads/eccentric load on embedments - NCR WBNCEB8203.

10. This item has been reassigned to Note 7.

11. Lack of documented operating conditions for thermal analysis - NCR WBNCEB8215.

12. Lack of calculations to justify alternate analysis - NCR WBNSWP8252.

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 AFW systems have not been modified, redesigned, or initially designed per revised analysis - NCR, ECN 3511.

15. This item has been reassigned to Note 6.

16. This item has been reassigned to Note 6.

17. This item has been reassigned to Note 7.

18. Substitution of fillet welds are allowed by General Note 3 on TVA drawing 47A650-IT was found to be inadequate - NCR WBNSWP8273.

19. Equipment cannot be determined to be environmentally qualified to NUREG-0588 - WBNEEB8104, WBNEEB8112.

20. No procedures for documenting time delay relay settings that are determined by preoperational tests - NCR WBNEEB8301.

21. This item has been reassigned to Note 4.

22. This item has been reassigned to Note 32.

23. The auxiliary feed pump turbine trip and throttle valve FCV-1-51 is not included in th ctive valve list. Also, the valve is powered fro mtwo redundant divisions through a manual-transfer device. Based upon the criteria the cir -should be identified by a suffix S. The design of the valve schematic does not include the required control room bypass and test indication, c automatic bypass of the "open" torque switch - WBNSWP8270, ECN 3642.

24. This item has been reassigned to Note 19.

25. Flange evaluations were omitted in some of the analysis calculations - NCR WBNCEB8222-R1.

26. These items have been reassigned to Note 6.

27. This item has been reassigned to Note 4.

28. This item has been reassigned to Note 6.

29. This item has been split and reassigned to Notes 7 and 12.

30. Failure to satisfy design criteria for monitoring operability and providing adequate electrical protective devices for the motor-driven auxiliary feedwater pump lube oil pump which was added by design change - ECN 3636.

31. Editorial discrepancies in licensing documents -

32. Incompatible non-electrical drawings - WBNSWP8248, ECN 2576, ECN 3511.

33. Inadequate cable tagging -

34. Platform installed in location different from that shown on an "out of function" piping drawing - ECN 3511.

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)	155	Yes	NA	NA
1(3)	21	TBD	TBD	
3	25	TBD	B	
4	11	TBD	B	
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	C	
14	22	No	A	
18	1	TBD	C	
19	2	No	A	Yes
20	5	No	A	
23	2	No	A	
25	1	TBD	C	
30	2	No	A	
31	2	TBD	C	
32	19	TBD	B	
33	2	TBD	C	
34	1	TBD	C	

Summary:

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

Notes:

1. TBD - to be determined

2. Relative importance to safety base on informative evaluated to date with A being most important and C being least important.

E63017.02

TVA Task Force for
Review of Black &
Veatch Findings

BLACK & VEATCH
EVALUATION SHEET

1. Task Force Category ____ for _____

2. Task Force Category Description and Related B&V Findings:

3. Evaluation for Cause

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

4. Evaluation for Generic Examples

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

5. Licensing Basis Satisfaction

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7A. Identification of Corrective Action for Completed Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / _____ Task Force Concurrence _____ / / _____

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / _____ Task Force Concurrence _____ / / _____

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

B. Final

Resp. Org. _____ / / _____ Task Force Concurrence _____ / / _____

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10A. Identification of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

B. Final

Resp. Org. _____ / / _____ Task Force Concurrence _____ / / _____

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

Resp. Org. _____ / / _____ Task Force Concurrence _____ / / _____

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / _____ Task Force Concurrence _____ / / _____

10B. Identification of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

TVA 64 (OS-9-65)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

EDC '830502 401

TO : OEDC MO Files

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

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 (OS-9-65)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

TO : OEDC Manager's Office Files

EDC '830802 401

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 nonconformances 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
VI	Other items	

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

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 830815 404

TO : 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.

E Gray Beasley

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

TVA 64 (OS-9-65)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

EDC '831006 402

TO : 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 831004 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

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 1 piping greater than 1 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 (OS-9-65)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

EDC '831207 403

TO : OEDC Manager's Office Files

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 1 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

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 1 auxiliary 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

12/2/83

Plant	Number of Categories	Categories Closed	Responsibility				Being Typed & Signed
			Task Force	Line Org.	NUC PR (Funds)	EGB	
WBN 1	25	13	3[1]	5[2]	1[3]*	1[4]	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.

TVA 64 (OS-9-65)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

QMS '840925 202

TO : Office of Engineering Files

FROM : 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.

H24265.01

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, W11A9 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) Note commendation for job well
H. L. Jones, W10D225 C-K) done in last paragraph above.
J. A. McDonald, 345 SPB-K) --RWC
R. C. McKay, Jr., Watts Bar CONST)
R. W. Olson, Sequoyah CONST)
H24265.01

TVA 64 109 0-80

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

CRS '840705 053

TO: 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

8407190661 (1)

JUL 6 '84

ENGINEERING DESIGN

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 6020-K.

H N Culver

H. N. Culver

CRS '84 0709 004

JFM:HNC:LML
Attachment
cc (Attachment):
J. W. Anderson, 255 SPB-K
R. W. Cantrell, W11A1 C-K
J. P. Darling, 1750 CST2-C
R. M. Pierce, 104 ESTA-K
W. F. Willis, E12B16 C-K
MEDS, W5B63 C-K

7/9/84 - MDG
cc (Attachment):
L. J. Cooney, W6D224 C-K
J. C. Standifer, 204 CB-K
xc: MEDS, W5B63 C-K

TVA 38 (08-0-88)

UNITED STATES GOVERNMENT

Memorandum

8407107O225 (21)

TENNESSEE VALLEY AUTHORITY

GNS '840705 053

TO : 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

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Original Signed 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
MEDS, W5B63 C-K

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: James F. Murdock
JAMES F. MURDOCK

DATE

NEDS, WED63 C-K

TABLE OF CONTENTS

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:

1. the quality and appropriateness of the B&V review and the selection of the AFW system as the representative system;

2. the technical adequacy and consistency of the TVA responses to the individual B&V findings;

3. 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

4. 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.

4. 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 valuable 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:

1. 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.

2. 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 1½ 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

1. 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 crosstie 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.

6. 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:

1. 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.

2. 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 embedded plate. Construction Specification N3C-928 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 C03-S-84-0089-D01 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 approximately 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 piping 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 NUREG0588. 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 not 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, 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) monitoring 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:

1. Excess cable coiled and hanging from edges of cable trays.

2. 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 38 (08-84)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

GNS '840906 101

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

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

DATE : September 5, 1984

840911H0049 (9)

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 W Culver

H. N. Culver

VSO PRW

VSO:BJN

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

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. Mashburn
W. MASHBURN — 9-5-84 DATE

J. D. Smith
J. D. SMITH — 9-5-84 DATE

P R Washer
P. R. WASHER — 9-5-84 DATE

V. S. O'Block
V. S. O'BLOCK — 9-5-84 DATE

APPROVED BY:

FOR P R Washer
J. F. MURDOCK — 9-5-84 DATE

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B. R-84-19-WBN-02 (Category 9)

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

C. R-84-19-WBN-03 (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 11 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.

1. 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.

3. 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 l 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 actual 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

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

L02 840731 016 EDC '84 0801 601

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

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

JUL 31 1984 840810D0072

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 (REF: MEMO, HNC TO HGP, 7/5/84) (CNS 840705 053) (DCS 840709006) VA

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 which apparently were not provided to you during your review. These details have already been presented to your staff in a meeting on July 25, 1984. 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 NSRS.

We believe this response and the commitments adequately address the concerns of your staff, and all findings can be closed. Any questions concerning this response should be addressed to J. A. Thompson of the Project Manager's organization (WPM) at extension [illegible]-K.

VA
AUG 1 '84
ENGINEERING DESIGN
MANAGER'S OFFICE

RMP:JAT:JARF
Attachment
cc (Attachment):
ARMS, 640 CST2-C
J. W. Anderson, 255 SPB-K
C. Bonine, Jr., E7B24 C-K
R. W. Cantrell, W11A9 C-K
J. P. Darling, 1750 CST2-C
MEDS, W5B63 C-K
D. R. Patterson, W12A7 C-K
R. M. Pierce, 104 FSTA-K

DES '84 0801 015

8/1/84 - MPG
(Attachment):
L. J. Cooney, W6D224 C-K
J. C. Standifer, 20% CB-K

: MEDS, W5B63 C-K

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 documentation. 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 84 (08-8-83)

UNITED STATES GOVERNMENT

Memorandum

8407137T0362 (1)

TENNESSEE VALLEY AUTHORITY

EDC '84 0710 601

TO : Those listed

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

DATE : 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.

R. M. Pierce

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

U44192.01

TVA 38 (08-83)

UNITED STATES GOVERNMENT

Memorandum

8407310180

TENNESSEE VALLEY AUTHORITY

EDC '84 0730 701

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

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

DATE : JUL 30 1984

SUBJECT: BELLEFONTE 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.

2. 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.

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

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 Verrelli (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.

W. R. Brown

WRB:MS
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

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

BFP '84 0921 019

TO : 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)

840927T0067 (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. Plan

   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.

for N. R. Beasley

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

TVA 40 (05-84)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

QMS '840928 201

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

8410040282

(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)

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).

H24271.01

H. N. Culver
OCT 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.

R. W. Cantrell

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, Sequoyah
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 - ENG
W. F. Willis, E12B16 C-K

Principally Prepared By: E. Gray Beasley, Extension 6606

BC/SC/PM: 10/9/84 TRB EGB

MO: 10/5

H24271.01

TVA 64 (09-9-85)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

BLP '83 0705 019

TO : Those listed

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

DATE : JUL 5 1983

8307110167 (4)

SUBJECT: BELLEFONTE NUCLEAR PLANT - NONCONFORMANCE REPORT NO. BLNQAB8101

Attached is a copy of the subject nonconformance report for which all corrective action has been completed.

R. M. Hodges

J. W. Anderson, M155G MIB-K
L. J. Cooney, W6D224 C-K
L. S. Cox, Bellefonte CONST (3)

MWS:BH
Attachment
cc (Attachment):
MEDS, W5B63 C-K
M. W. Stevenson, 1168 IBM-K

U13180.05

DIVISION OF ENGINEERING DESIGN

NONCONFORMANCE REPORT

QAS 8105210062

[1] REPORT NO. BLNBLP8101

[2] PROJECT Bellefonte [3] PLANT [4] UNITS 1 and 2

[5] PREPARER/ORGANIZATION/DATE J. F. French/Quality Assurance Branch/March 31, 1981

[6] DESCRIPTION OF CONDITION

Various FCLD's (Functional Control Logic Diagrams) and control logic implementation do not adequately reflect design criteria requirements. Also, other design drawings do not accurately reflect design criteria. Investigations of the referenced NCR's indicate that there are possible generic implications. Refer to NCR's BLNBLP8101, BLNBLP8010, BLNBLP8016, BLNBLP8003, etc.

NV C/CD

[7] DATE OF OCCURRENCE EST (X), ACT. ( ) 1980

[8] METHOD OF DISCOVERY Drawing revision

[9] UNID CODE (EN DES-EP 8.01)

[10] SCHEDULE IMPACT ☐P ☐A ☐N

[11] ECN REQUIRED ☐ YES ☐ NO

[12] SIGNIFICANT CONDITION ADVERSE TO QUALITY

YES ☒ NO ☐

[13] *BRANCH CHIEF/DATE R A Costner 3-31-81

[14] CORRECTIVE ACTION: The FCLD's, design criteria, and wiring diagrams are being reviewed to assure that they are compatible.

[15] ASSIGNABLE CAUSE (REQUIRED IF SIGNIFICANT)

Functional control logic diagrams for Bellefonte Nuclear Plant were produced and revised as necessary by the Electrical Engineering Branch until the latter part of 1980. The responsibilities of following the changes on this project as well as several other projects resulted in an inadequate design review. The errors in logic were of a random nature and do not indicate a generic problem. No failure to comply to EN DES-EP 4.25 were found.

[16] ACTION REQUIRED TO PREVENT RECURRENCE (REQUIRED IF SIGNIFICANT)

The responsibility of the FCLD's has been transferred to the project. Design reviews can now be accomplished by the project on all drawings.

[17] *QA ENGINEER REVIEW AND CONCURRENCE: J. F. French 5/1/81

[18] LABOR EST. ( ) ACT. ( ) MH [19] SCHEDULE EST. ( ) ACT. ( ) DAYS

[20] ACTIVITY NO. [21] TASK DESCRIPTION [22] DATE INITIATED

[23] REMARKS:

[24] ALL ACTION COMPLETE R B Hodges 7 5 13
BRANCH CHIEF/CRG. DATE

[25] *NCR CLOSED QAS 820511 004
CHIEF, QUALITY ENGINEERING BRANCH DATE

[26] DISTRIBUTION

[27] QES QA GROUP ENGINEERING SECTION
QESC QA
ORIGINALS (For Significant NCR's)**
QES
NCRS (For Significant NCR's)

NEDS, E4B37 C-K

DISTRIBUTE AFTER THIS SIGNATURE
BY

QES USE

BLP '83 0705 020

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

BLP '83 0519 020

TO : Bellefonte Design 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) BLNQAB8101

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

2GW0900-CD
2GW0900-CV
2GW0900-KC
2GW0900-KD
2GW0900-RF
2GW0900-VA
2GW0900-VC
2GW0900-VE
2GW0900-VK

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

2GW0900-VE
2GW0900-ND
2GW0900-NV
2GW0900-VH

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

H. C. Rutherford

ASM WRT:BH

cc: E. O. Massey, 1170 IBM-K
J. L. Springer, 1111 IBM-K
M. W. Stevenson, 1146 IBM-K
W. R. Tatum, 1146 IBM-K
R. M. Hodges, 1117 IBM-K

5/19/83 - RMH:DG

cc: NEDS, W3B63 C-K

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

BLP 830629 011

TO : Bellefonte Design Project Files

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

DATE : JUN 29 1983

SUBJECT: BELLEFONTE NUCLEAR PLANT - DRAWINGS AND DOCUMENTATION REVIEW

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:

2GW0900-NE
2GW0900-ND
2GW0900-NV
2GW0900-VH

H. C. Rutherford

BDM: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 - BWH:DG
cc: MEDS, W9B63 C-K

BLP830705019

EN DES 8307111T0168 (1)

NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

NCR NO. BLNQAB 8101

SIGNIFICANT
YES ☐ NO ☐

REPORTABLE
YES ☐ NO ☐

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 ☐ No ☐ If yes, list in (C) below.

C. Documents related to the NCR (ECN, analyses, memos, contract No., etc.)

	REF OR MEDS ACCESS. NO.	STATUS WORKING (see (F) below)	STATUS COMPLETE
H.C. RUTHERFORD TO FILE (MAY 17, 1983)	BLP830516-620		✓
H.C. RUTHERFORD TO FILE (JUNE 29, 1983)	BLP830629011		✓

D. 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 ☒ 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 ☐

H. Remarks:

Verified By M. W. Stevens Date 6/29/83

TVA 84 (08-1-83)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

BLF '83 0914 013

TO : 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 14 1983

8309230150 (3)

SUBJECT: BELLEFONTE 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".

for R. M. Hodges

WTH:KB
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

Q23255.02

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: BLNBLP8003, BLNBLP8010, BLNBLP8101, and BLNBLP8016. 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.

William T. Hollett
Preparer

Elmo C Matthews
Independent Reviewer

Edwin O. Marley
Reviewer

L. Spruce
Approver

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

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

8410150543

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

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 current.

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 Signed By

R. M. Pierce

FWC:WMR:BB

cc: E. G. Beasley, W12B21 C-K
R. W. Cantrell, W11A9 C-K
F. W. Chandler, W8C126 C-K
H. G. Parris, 500A CST2-C
Principally Prepared By: W. M. Roop, Jr., Extension 3449.
J. C. Standifer, P-104 SB-K
G. Wadewitz, Watts Bar Nuclear CONST (3)
W. F. Willis, E12B16 C-K
MEDS, W5B63 C-K

024278.01

TVA 64 (08-9-68)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

BLP '83 0629 011

TO : Bellefonte Design Project Files

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

DATE : JUN 29 1983

8307071O182 (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

H. C. Rutherford

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

TVA 64 (08-0-68)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

BLP '83 0519 020

TO : Bellefonte Design Project Files

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

DATE : May 17, 1983

8305240089 (1)

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.

2GW0900-CD
2GW0900-CV
2GW0900-KC
2GW0900-KD
2GW0900-RF
2GW0900-VA
2GW0900-VC
2GW0900-VE
2GW0900-VK

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.

H. C. Rutherford

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

[redacted]

TVA 10075C (EN DES-10-79) **ENGINEERING CHANGE NOTICE** — [handwritten initials] ~~5-25-84~~ DATE

COVER SHEET ~~WBP 840525 535~~

SWP 810610 500

(BEFORE ISSUANCE OF OPERATING LICENSE)

This ECN has been rescoped to delete unit 2 work unissued as of 5-1-84. Remaining unit 2 work will be implemented under ECN 4257. 6-1-84

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ECN NO. 2576

To: Construction Project Manager ~~Watts Bar Nuclear Plant~~

From: Design Project Manager

DATE JAN 13 198

840710F0024 (125)

[signature]	WMG-2	[signature]
Prepared by	Section	Section Leader

[signature]	Released: [signature]	1-12-81
Project Engineer	Design Project Manager	Date

SCOPE

Project: Watts Bar Nuclear Plant — Affected Unit(s): 1 & 2

System or Feature: Various Piping Systems

Reference & Description of Change: Addition of pipe support numbers to the Rigorous analysis Isometric drawings (NCRs WBNSWP 8108 & WBNSWP 8148) Added 1/24/81

DRAWINGS OR B/M'S INVOLVED: (Data Sheets Required)	Yes or No	Date Branch Data Sheet Available
Thermal Power Engineering Branches		
Civil (piping analysis)	Yes	
Electrical	No	
Mechanical	No	
Nuclear	No	
Thermal Power Engineering Des Project		
Civil	No	
Electrical		
Mech #1, #2, #3	Yes	
Arch, Hydro, & Spec Proj Eng & Des		
Arch	No	
Civil	No	
Electrical	No	
Mech	No	

6-18-84 CLOSURE SH. # 134

Thermal Power Engineering Branches Approval Required	Yes or No
	YES
Design ready for TPE branch review: [signature] Design Project Manager	11/21/80 Date
Approved: R.O. Barnett, TPE Civil Br. Chief	12-2-80 Date
N/A, TPE Electrical Br. Chief	Date
N/A, TPE Mechanical Br. Chief	Date
N/A, Chief Nuclear Engineer	Date

WBP 840525 543

	Yes or No
Required for PSAR or FSAR	No
Required for Preoperational Test:	No
Vendor Backcharges Involved	No
Seismic Analysis Required	~~No~~ YES
Nonconformance Report Required	~~No~~ YES SEE ABOVE
QA Applies	Yes
Vendor(s) involved:	No

PHYSICAL WORK MUST BE DONE BEFORE:

	Pre-Op Test	1st Fuel Load	1% Therm Power	Comm'l Oper'n	1st Refuel	
Unit(s) 1						—
Unit(s) 2		✓				—

~~WBP 840618 523~~

CC (Attachments): No - Yes (X)

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, W8C126 C-K
Chief, Electrical Engineering & Design Branch, W2D224 C-K
MEDS, E4B37 C-K
Chief Nuclear Engineer, W10C126 C-K
Chief, Mechanical Engineering Branch, W10D225 C-K
Chief, Mechanical Engineering & Design Branch, 102SPT-K
Chief, Quality Engineering Branch, W11C126 C-K
Manager of Construction, E7B24 C-K
Chief, Cost Planning and Control Staff, W12C74 C-K
Plant Superintendent

Sheet 1

IMPACT AND JUSTIFICATION FORM

TVA ECN No. 2576
LJ No. 694
Date 11/13/80

PROJECT Watts Bar Nuclear Plant

1. Description of Proposed Change Addition of pipe support numbers to the Rigorous Analysis drawings

ZB Harris
Originator

2. Category:

☒ 1. Proposed ECN essential for unit operation and may not be deferred until after unit operation license.

☐ 2. Proposed ECN affects plant operating reliability and/or availability. Proposed ECN implementation may be deferred until after unit operation license.

☐ 3. Proposed ECN is to improve plant operating flexibility and/or convenience. Proposed ECN implementation may be deferred until after unit operation license.

3. Justification for Selection of Category This documentation will be used by Const. to facilitate the identification of support and anchor locations for various piping systems

☒ Proceed With Further Consideration as Category 1, 2, or 3 (circle one)

☐ Do Not Proceed With Further Consideration

Section Supervisor	11-13-80 Date	Head/Project Engineer	Date

[redacted] [redacted]

PROJECT *Watts Bar Nuclear* Sheet 2 IJ No. *694*

5. Design and Procurement - Section Involvement - Schedule Duration

Work Duration Bar Graph (~~Weeks~~/Months)

BRANCH	SUPV	M-H	
SWP	JLPO	800	*
SWP	KBA	800	*
SWP	RGP	800	*
CEB	VOL	1600	294

Time Now

6. Summary *A total of ~~4000~~ 3800 MH AND 294 modified Drawings to REVISE.*

** ~~??~~ # of Supp. Hanger drawings not determined at this time.*

7. Recommended Disposition and Remarks

Hangers are being added to analysis isometrics to facilitate construction with hanger installation. Any physical work associated with this is required to be complete by fuel load.

8. Signatures

Section Supervisor | Head/Project Engineer | Branch Chief | Project

9. Disposition by Design Project Manager

Initials / Date — Proceed to Implement Design and Construction Before Unit Operation License

Initials / Date — Place in Control File for Possible Implementation Per ID-QAP 2.2 and EP 4.02

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2576
DATA SHEET NO. 1

BRANCH SWP
PAGE 1

To: Watts Bar Nuclear Plant, Spring City, TN

Design Project Manager [redacted]
JAN 15 1991

Released By: [signature] Design Project Manager

Preparing Section	WMG # 2
Prepared By:	[signature]
Total Pages (RO):	2
Section Supervisor:	[signature]
Staff Eng. or Architect:	[signature]
Group Head:	[signature]
Branch Chief:	[signature] Date

	MEDS Accession No.		MEDS Accession No.
RO	SWP '81 0113 536	R4	WBP '830815 518
R1	SWP '81 0917 546	R5	WBP '840525 645
R2	SWP '82 1129 513	R6	
R3	WBP '840525 544	R7	

SCOPE

Project Watts Bar Nuclear Plant — Affected Units 1 & 2

System or Feature Various piping Systems Reactor & Auxiliary Buildings

Reference & Description of Change Revise physical piping drawings on various systems to include piping support numbers and various changes to support drawings discovered while locating piping support numbers on analysis isometrics & physical piping drawings.

DATE

CLOSURE SH. #

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PREPARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
1	9-14-87	CWP	[illegible]	[illegible]	N/A	FSM	[illegible]	DELETED AND/OR ADDED SUP. & PIPING DWGS.	3
2	9-3-82	[illegible]	[illegible]	[illegible]	N/A	CE	JCS/	added support dwgs	11
3	11-29-82	MFS	[illegible]	[illegible]	N/A	HH	JCS/	ADDED 47W400-11 and 47W400-12	12
4	2-15-83	RLT	[illegible]	[illegible]	N/A	MK	JCS/	ADDED UNIT 2 ESTIMATE	12
5	5-25-84	MK	[illegible]	[illegible]	CRS	MK	[illegible]	Delete unit 2 dwgs. see ECN 4857(aa)	12

WO.
Issued Materials as follows:

Additional Information:

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 10875A (EN DES-6-78)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2576
DATA SHEET NO. 1

AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE ON DA. SH.
	~~47W400 -1~~					1
	~~-2~~					1
	~~-3~~					1
	~~4~~					1
	~~-5~~					1
	~~-6~~					2
	~~-7~~					—
	~~-8~~					—
	~~-9~~					—
	~~10~~					2
1	-11	4	11-30-81	4-30-81		
~~-2~~	~~-12~~		11-30-82			5
	47W401 - 1	15	9-11-81	9-11-81		
	-2					1
	-3					1
	~~4~~					
	~~5~~					1
	47W401 -6	8	9-11-81	9-11-81		
	-7	9	9-11-81	9-11-81		
	-8	3	9-11-81	9-11-81		
	-9	8	9-11-81	9-11-81		
	~~47W427 -1~~					1
	~~-2~~					1
	~~-3~~					1
	~~-4~~					1
	~~-5~~					1
	~~6~~					1
	~~7~~					1
	~~8~~					1
1&2	47W415-1	4	9-11-81	9-11-81		1
~~1~~	~~1-01A-354~~		9-11-81			~~1~~
~~1~~	~~1-01A-355~~		9-11-81			~~1~~
1	1-01A-435	1	9-11-81	9-11-81		1
1	1-01A-439	1	9-11-81	9-11-81		1
~~1~~	~~1-01A-440~~		9-11-81			~~1~~
~~1~~	~~1-01A-432~~		9-11-81			~~1~~

TVA 10675E (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2576

DATA SHEET NO. 21

PAGE 3

ED	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.	
2	2-01A-485	1	9-11-81	9-11-81			1
2	2-01A-489	1	9-11-81	9-11-81			1
2	2-03A-455	1	9-11-81	9-11-81			1
1	47A400-11-39	2	9-11-81	9-11-81			1
+	~~1-03A-442~~				~~Load Change~~		~~2~~
+	~~1-03A-443~~				~~NEW STRUT REQUIRED~~		~~2~~
+	~~447~~				~~STRUT CHANGED TO SPRING~~		~~2~~
1	1-03A-453	03	3-12-82	3-11-82	Load Change	02-07	2
1	455	03			" "		2
1	466	02			" "		2
1	469	01			~~Redesign~~ LOAD CHANGE	0207	1
	480	01		3-11-82	Change Spring	02-08	
	481	01			Load change		
	484	04	3-12-82		" "		
	~~486~~				Drawing "		
	488	01	3-12-82		Load "		
	489	02			~~Steel Member added~~ ~~Load Change~~ STEEL MEMBER ADDED		
	492	01			~~Drawing change~~		
	493	02		3-11-82	Snubber "		
	499	03			Load "		
	499	03			Redesign		
	505	02			Load Change	02-08	
	506	01			LOAD CHANGE	02-08	
	490	02	3-12-82	3-11-82	LOAD CHANGE	0208	
1	1-03A-407	1		3-23-82	NO CONST WORK	02-06	2
	408	2					
	409	2					
	411	1			CONSTRUCTION REQUIRED		
	416	1			CONSTRUCTION REQUIRED		
	418	3					
	422	2		3-23-82			
	1-03A-423	99		4-13-82	NO CONST WORK		
+	47A401-8-1	0		4-23-82	NEW SUPPORT		
1	47A401-6-1	0		4-23-82	NEW Support	02-06	2
1	1-03A-494	02		3-11-82	LOAD CHANGE	02-08	2

TVA 10878E (EN DES-7-79)

ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. ____

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE L ON DRT. REV. NO.
1	1-03A-203	1		1-30-82	LOAD CHANGE 02-01	2
	-204	3			LOAD CHANGE	
	-205	1			CONST. WORK REQ'D.	
	-206	1			CONST. WORK REQ'D	
	-207	3			LOAD & MOVM'T CHANGE	
	-208	1			LOAD CHANGE ONLY	
	-209	1				
	-210	2				
1	1-03A-240	901		2-3-82	CONST. WORK REQ'D 02-02	2
	-242	901			LOAD CHANGE ONLY	
	-243	901			LOAD CHANGE ONLY	
	-244	901			LOAD & MOVM'T CHANGE	
	-245	903			LOAN CHANGE ONLY	
	-247	901				
	-248	902				
	-249	901				
	-250..	901				
1	1-03A-280	901		2-8-82	CONST. WORK REQ'D 02-03	2
	-281	901			LOAD CHANGE ONLY	
	-282	901			LOAD CHANGE ONLY	
	-283	901			LOAD CHANGE ONLY	
	-284	901			CONST. WORK REQ'D	
	-285	904			LOAD CHANGE ONLY	
	-286	902			LOAD CHANGE ONLY	
	-287	902			CONST. WORK REQ'D.	
	-288	902			LOAD CHANGE ONLY	
	-289	902				
	-290	902		2-8-82		
	-291	901				
	-292	901				

TVA 10875E (EN DES-7-79)

ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. ____

PAGE 5

AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	1-03A-320	1		2-5-82	Load & Movmt changed 02-04	2
	-321	1				
	-323	1				
	-324	3				
	-326	1				
	-327	5			Data pt. was wrong	
	-328	2			Load & Movmt changed	
	-329	1				
	-330	3				
	-331	1			Load & Data pt. changed	
	-332	1			Load change	
	-333	1		2-5-82	Load change	
1	1-01A-391	2		3-1-82	No const work req'd 86-03	2
~~1~~	~~1-03A-442~~				~~Load Change 02-02~~	~~2~~
	~~443~~				~~New Sheet Add'd~~	~~2~~
	~~447~~				~~Sheet Change to Form 02-02~~	~~2~~
1	1-03A-486	904		4-13-82	02-08	2
1	1-03A-365	902	3-12-82	3-8-82	Load change 02-05	2
1	-369	902			Load & Mvmt change	
1	-370	901			"	
1	-372	902			Load change	
1	-374	902			Load & Mvmt change	
1	1-03A-375	901			Revised & Redesigned	
1	-376	901			Revised & Redesigned	2
1	1-03A-377	901	3-12-82	3-8-82	Load & Mvmt change 02-05	2
1	A7A400-8-1	2		3-23-82	~~Relocated~~ Redesigned Attachment	2
1	A7A400-8-2	2		3-23-82	Relocated Snubber	2
2	2-63A-280		5-4-82	5-25-82	Load Change Only	2
1	1-03A-498	3		4-15-82		2

TVA 10875E (EN 0683-7-79)

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 DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UP ON DAT.: REV. NO.	
1	03B-1AFW- R095	904		6-14-82	LOAD REVISED	PIPE # 12A	2
	-R096	901			LOC. CHANGE		
	-R097	901			LOAD CHANGED CONST. WORK REQ'D		
	-R100	902			LOC. CHANGE		
	-R99	901			LOAD CHANGE		
	-R107	901			LOAD CHANGE	10A	
	-R109	901			LOAD CHANGE CONST. WORK REQ'D		
	47A060-3-3	3			LOAD CHANGE		
	3-4	1			LOAD CHANGE		
	3-6	2			LOAD CHANGE	12A	
	3-7	2			LOAD CHANGE	12A	
	03B-1AFW-R103	901			LOAD CHANGE	12A	
	-R104	903			CONST. WORK REQ'D	10A	
	-R105	901			LOC. CHANGE	10A	
2	03B-2AFW-R95	901		6-14-82	LOAD CHANGE	19A	
	-R97	901			CONST. WORK REQ'D		
	-R99	901			LOAD CHANGE		
	-R101	901			CONST. WORK REQ'D		
	-R103	901			LOAD CHANGE		
	47A060-3-30	1			LOAD CHANGE		
	-[redacted]						
	03B-2AFW-R107	901			LOAD CHANGE	17A	
	-R109	901			LOAD CHANGE		
	-R110	901			LOAD CHANGE		
	-R111	901			LOAD CHANGE		
2	47A060-3-31	[redacted]			New Support		
2	-32	[redacted]			" "		
2	-33	0			" "		
2	-33A	0			" "		
1	03B-1AFW-R167	902		7-2-82	REV. LOCATION	NB-3-11A - CASE #'s	2
	03B-1AFW-R168	903		7-2-82	REV. DATA PT.	" " "	2
	03B-1AFW-V177	905		7-2-82	REV. LOCATION	" " "	2

TVA 10575E (EN DES-7-79)

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 DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	47W427-1H	1		8-2-82	ADDED SUPPORT DWGS	2
	-2H	2				
	-3H	1				
1	47W427-4	17		8-2-82	ADDED SUPPORT DWGS	2
1	47W401-6	8		7-27-82		
						PER #
1	038-1AFW-R005	901		9-2-82	CONST. UNIT 1 LOAD CHANGE	NS-3-148821 2
	-R2	903		8-25-82	CONST. UNIT 1 LOAD CHANGE	
	-R6	901		8-25-82	CONST. UNIT 1 LOAD CHANGE	
	-R7	901		8-25-82	LOAD CHANGE	
	-R8	905		9-2-82	CONST. UNIT 1 DWG VOIDED	
	-R9	904		8-23-82	LOAD CHANGE	
	-R10	902		8-23-82	LOAD CHANGE	
	-R11	901		8-23-82	LOAD CHANGE	
	-R12	901		9-2-82	LOAD CHANGE CONST. UNIT 1	
	-R14	903		9-2-82	DWG. VOIDED CONST. UNIT 1	
	-R15	903		8-23-82	LOAD CHANGE	
	-R16	903		9-2-82	DWG. VOIDED CONST. UNIT 1	
	-R17	905		8-25-82	LOAD CHANGE	
	-R18	902		9-2-82	LOAD CHANGE CONST. UNIT 1	
	-R19	901		8-23-82	LOAD CHANGE	
	-R20	901		9-2-82	LOAD CHANGE	
	-R25	903		8-23-82	LOAD CHANGE	
	-R28	903		8-25-82	LOAD CHANGE	
	-R29	902		8-25-82	LOAD CHANGE	
	-R31	902		8-25-82	LOAD CHANGE	
	-R35	901		9-2-82	DWG. VOIDED CONST. UNIT 1	
	-R121	904		8-25-82	CONST. UNIT 1 DIMENSION CHANGE	
1	038-1AFW-R137	902		8-25-82	CONST. UNIT 1 LOCATION CHANGE	NS-3-14
1	038-1AFW-V13	90'		9-2-82	CONST. UNIT 1 DWG VOIDED	NS-3-148821 2
1	038-1AFW-V21	90'		9-2-82	CONST. UNIT 1 DWG VOIDED	NS-3-148821 2

TVA 10575E (EN DES-7-79)

ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. ____

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE # ON DATA REV. NO.
1	1-03A-400	902		8-23-82	LOAD CHANGE	2
	-401	902		8-23-82	LOAD CHANGE	
	-402	902		8-23-82	LOAD CHG. & LOCATION CHG.	
	-403	904		8-23-82	LOAD CHANGE	
	-404	903		9-2-82	DWG. VOIDED	
	-405	903		8-23-82	LOAD CHANGE	
	-413	901		8-23-82	LOAD CHANGE	
	-414	901		8-23-82	LOAD CHANGE	
	-415	903		9-2-82	LOAD CHANGE	
	1-03A -406	902		9-1-82	LOAD CHG.	
1	1-03B -71	903		8-25-82	LOAD CHANGE	2
	-73	903		8-25-82	LOAD CHANGE	
	-78	903		8-23-82	LOAD CHANGE	
	-79	902		8-25-82	LOAD CHANGE	
	-81	903		8-23-82	LOAD CHANGE	
	-83	902		8-25-82	LOAD CHANGE	
	-82	904		9-1-82	LOAD CHANGE	
1	47A427-2-31	R0		9-2-82	NEW SUPPORT	2
1	47A427-6-1	R0		9-2-82	NEW SUPPORT	2
	~~6-1A~~	~~R0~~			~~NEW SUPPORT~~	
1	47A427-6-1A	R0		9-2-82	NEW SUPPORT	2
1	47A427-6-1B	R0		9-2-82	NEW SUPPORT	2
1	03B-1AFW-R3	902		9-1-82	LOAD INCREASE	2
1	03B-1AFW-R32	903		9-1-82	LOAD CHANGE	2
1	03B-1AFW-R34	901		9-2-82	DWG. VOIDED	2
1	1-03B.-80	905		9-1-82	LOAD CHG.	2

TVA 10875E (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2526

DATA SHEET NO. ____

FECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
						PREV. 2
1	1-038 -1	901		9-1-82	CONST WORK REQ'D OR 01	2
	-2	901		9-1-82	~~VOID DWG~~ CONST. WORK REQ'D.	
	-3	903		9-2-82	CONST WORK REQ'D	
	-4	901		9-1-82	~~VOID DWG~~ CONST. WORK REQ'D.	
	-5	903		9-1-82	LOAD CHANGE	
	-6	903		9-1-82	DOCUMENT CHANGE	
	-7	903		9-1-82	LOAD CHANGE	
	-8	904		9-1-82		
	-9	903		9-1-82		
	-10	903		9-1-82		
	-11	903		9-2-82	CONST. WORK REQ'D.	
	-12	903		9-2-82	LOAD CHANGE	
	-13	903		9-2-82		
	-14			9-2-82		
	-15			9-2-82		
	-16			9-1-82		
	-17			9-2-82		
	-18			9-2-82		
	-19			9-2-82		
	-20	903		9-2-82		
	-21			9-2-82		
	-22			9-2-82		
	-23			9-2-82		
	-24	901		9-1-82	~~DWG IS VOIDED~~ CONST. WORK REQ'D.	
	-25	901		9-1-82	LOAD CHANGE	
	-26	901		9-1-82	~~DWG IS VOIDED~~ CONST. WORK REQ'D.	
	-27	903		9-2-82	LOAD CHANGE	
	-28	901		9-1-82	~~DWG IS VOIDED~~ CONST. WORK REQ'D.	
	-29			9-1-82		
	-30			9-1-82		
	-31			9-1-82		
	-32			9-1-82		
	-33			9-1-82		
	-34	902		9-2-82	DOCUMENT CHANGE ONLY ~~LOAD CHANGE~~ THERMAL	
	-35	902		9-2-82	MOVMT CHANGE ONLY	
	1-038 -37	901		9-1-82	LOAD CHANGE	

TVA 10875E (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 25-26

DATA SHEET NO. ____

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE 5 ON DATA REV. NO.
						PROB. # 05-01 2
1	1-03A-440	903		9-2-82	LOAD CHANGE	
	1-03A-441	903		9-2-82		
	-442	901		9-2-82		
	-443	902		9-2-82		
	-444	904		9-2-82		
	-445	903		9-2-82	LOAD CHANGE	
	-446	904		9-2-82	CONST. WORK REQ'D	
	-447	903		9-1-82	CONST. WORK REQ'D	
	-449	902		9-2-82	LOAD CHANGE	
	-450	903		9-2-82	CONST WORK REQ'D	
	-451	905		9-1-82	HGR IS DELETED CONST. WORK REQ'D	
	-452	902		9-2-82	DOCUMENT CHANGE	
	-453	904		9-2-82		
	-454	903		9-2-82		
	-455	904		9-2-82	CONST WORK REQ'D	
	-456	903		9-2-82	LOAD CHANGE	
	-457	901		9-2-82		
	-458	902		9-2-82		
	1-03A-459	902		9-2-82		
	1-03B-39	902		9-2-82	CONST. WORK REQ'D	
1	1-03A-468	901		9-2-82	LOAD CHANGE	PROB # 02-07
1	1-03A-470	904		9-2-82		
1	1-03A-471	903		9-2-82		

TVA 10879E (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2576

DATA SHEET NO. 1

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	1-03B-53	905		9-2-82	LOAD CHANGED C.W.E. PER. NO. REDESIGNED / REDRAWN OE-02	2
	-55	901		9-2-82	LOAD CHANGE	
	-56	903		9-2-82		
	-57	901		9-2-82		
	-58	903		9-1-82		
	-59	904		9-1-82		
	-60	903		9-1-82		
	-61	901		9-2-82		
	-62	903		9-2-82		
	-63	903		9-2-82		
	-64	903		9-2-82		
	-65	903		9-2-82		
	-66	903		9-1-82		
	-67	903		9-2-82		
	-68	903		9-2-82		
	-69	903		9-2-82		
	-70	901		9-3-82	DWG VOIDED CONST. WORK READ	
	-72	901		9-3-82	DWG VOIDED CONST. WORK READ	
	-74	901		9-3-82	DWG VOIDED CONST. WORK READ	
	-75	901		9-3-82	DWG VOIDED CONST. WORK READ	
	-76	901		9-3-82	DWG VOIDED CONST. WORK READ	
	-77	901		9-3-82	DWG VOIDED CONST. WORK READ	
	-51	901		9-3-82	DWG VOIDED CONST. WORK READ	
	-52	901		9-3-82	DWG VOIDED CONST. WORK READ	
	1-03B-54	901		9-3-82	DWG VOIDED CONST. WORK READ	
1	47A600-105-1	1		9-20-82	DOCUMENT CHANGE	2
1	-1A	1		9-20-82	DOCUMENT CHANGE	2
1	-3	1		9-20-82	DOCUMENT CHANGE	2
1	-4	1		9-20-82	DOCUMENT CHANGE	2
1	-5	1		9-20-82	REDESIGN SUPPORT & PLATE	2
1	-5A	0		9-20-82	NEW SUPPORT	2
1	-6	1		9-20-82	DOCUMENT CHANGE	2
1	-6A	1		9-20-82	DOCUMENT CHANGE	
1	47A600-105-6B	1		9-20-82	DOCUMENT	

TVA 10679E (EN DES-7-79)

ENGINEERING CHANGE NOTICE NO. 2576 Sup 1

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 1

PAGE 12

AFFECTED UNIT	DRAWING OR SKM NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UP SKM DWG REV. NO.
1	47W400-11	6	11-22-82	11-22-82	ADDED	3
2	47W400-12	2	11-22-82	11-22-82	ADDED	3
	ESTIMATE 200	UNIT 2 DWGS				54

SCOPE OF CHANGE ESTIMATE

PROJECT: Watts Bar NUCLEAR PLANT ECN NO. 2576

ING: Auxiliary, Reactor LJ NO. 694

SYSTEM/FEATURE: Various Piping Systems

Item	Unit 1 Qty	Unit 2 Qty	Procured By (EN DES/CONST)	PR, Reqn, or Contr	Requested Delivery Date	CONST Contact For Verification
None —	No	Mat'l rels	Required			

NOTES:

[redacted]

[redacted]

ALLEY AUTHORITY
ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2576
DATA SHEET NO. 2

BRANCH CEB
PAGE 1

NPD Project Manager _____ Released By: _____ NPD Project Manager

A: _____

Preparing Section	MDR Accession No.	MDR Accession No.
TPE - CEB - PAS2	WBP '830708 518	WBP '840213 502
Preparer: [signature] Date: 6-28-83	WBP '830725 508	WBP '840326 517
Total Pages (RO): 33	WBP '830808 505	WBP '840525 545
Section Supervisor:	WBP '830909 500	
Staff Eng. or Architect:		
Group Head:		
Br. Chief/ Staff Mgr.:		

SCOPE

Project WATTS Bar Nuclear Plant Affected Units 1&2

System or Feature _____

Reference & Description of Change _____

CLOSURE SH.*

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
25	7-3-83	JHR	[illegible]	[illegible]	ROB	MK	[illegible]	ADD DWG's	33
26	7-22-83	JHR	JEM	TC	ROB	MK	[illegible]	Add Dwgs	33
27	8-8-83	JHR	JEM	TC	ROB	MK	[illegible]	Add Dwg Est	33
28	9-9-83	JRC	JEM	TC	ROB	MK	[illegible]	Delete Dwg's, Add Date	33
29	2-13-84	JRC	[illegible]	TC	ROB	MK	[illegible]	DELETE DWG, REVISE DATES, ADD DWGS.	34
30	[illegible]	DEM	[illegible]	TC	ROB	MK	[illegible]	ADD DWG'S & DELETE DWG'S	34
31	5-[illegible]-84	MK	JEM	TC	ROB	MK	[illegible]	Delete Unit 2 DWGS. Unit 2 ECN 4857	34

Instr. No. _____

Field Materials as follows:

Additional Information:

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN.

ENGINEERING CHANGE NOTICE NO. ______
DATA SHEET NO. ______

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE			REMARKS	[illegible]
			EXPECTED	ACTUAL			

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. E576
DATA SHEET NO. 2

BRANCH [illegible]
PAGE 1

LTP: _____

NPD Project Manager _____ Released By: _____ NPD Project Manager

cc: _____

Preparing Section	TPE - CEB - PAS2
Prepared By:	[illegible]
Total Pages (ROA)	11
Section Supervisor:	
Staff Eng. or Architect:	
Group Head:	
Br. Chief or Proj. Mgr.:	

MEB Assignment No.		MEB Assignment No.	
SWP	'83 0322 511	WBP	'830510 505
SWP	'83 0329 529	WBP	'830525 504
WBP	'830419 504	WBP	'830607 505
WBP	'830429 531	WBP	'830614 519

SCOPE

Project: Watts Bar Nuclear Plant — Affected Units: 1 2

System or Feature: _____

Reference & Description of Change: _____

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PREPARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
17	3-22-83	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Add DRAWINGS (PAGE 30)	32
18	3-29-83	JHR	JEM	TC	ROB	[illegible]	[illegible]	ADD SHT. 33, ADD DWGS.	33
19	4-19-83	JHR	JEM	TC	ROB	[illegible]	[illegible]	DELETE DWGS	33
20	4-28-83	JHR	JEM	TC	ROB	MKD	[illegible]	ADD DWGS	33
21	5-10-83	JNR	JEM	TC	ROB	MK	[illegible]	Add Dwgs.	33
22	5-27-83	JNR	JEM	TC	ROB	MK	[illegible]	Add Dwgs.	33
23	6-7-83	JNR	JEM	TC	ROB	MK	[illegible]	Add Dwgs	33
	6-14-83	JHR	[illegible]	TC	[illegible]	[illegible]	[illegible]	Add Dwgs.	33

Rev. no. _____

Field Materials as follows:

Additional Information:

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN.

ENGINEERING CHANGE NOTICE NO. ______
DATA SHEET NO. ______

PAGE [ ]

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	[illegible] IN QA REV.

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. Z576
DATA SHEET NO. 2

BRANCH CEB
PAGE 1 (2ND PAGE 1)

To: Watts Bar Nuclear Plant, Spring City, TN
Attn: Design Project Manager - 201 CST-K
cc:
Released By: Design Project Manager

Preparing Section	MAS
Prepared By:	W. H. LEE
Total Pages (RO):	11
Section Supervisor:	PREVIOUSLY SIGNED
Staff Eng. or Architect:	
Group Head:	
Branch Chief:	Date

WBNDS Assigned No.	WBNDS Assigned No.
SWP '82 0621 500 R2	SWP '82 1124 533 R1
SWP '82 0720 570 R1	SWP '83 0104 567 R1
SWP '82 1008 502 R2	SWP '83 0117 522 R1
SWP '82 1008 503 R2	SWP '83 0121 513 R1

SCOPE

Project: WATTS BAR NUCLEAR PLANT — Affected Units: 1 & 2

System or Feature: ALL CEB ISSUED ISOMETRIC DRAWINGS

Reference & Description of Change: REVISE ISOMETRIC DRAWINGS TO ADD SUPPORT MARK NUMBERS

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV NO	DATE ISSUED	PREPARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	O.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
9	6-18-82	WHL	JEM	WDE	ROB	CE	JCS	ADDED DWGS TO SHT 19	19
10	7-20-82	MAB	JEM	WDE	ROB	CE	JCS	ADD DWGS	26
11	8-25-82	MAB	JEM	WDE	ROB	CE	JCS	ADD DWGS	27
12	10-8-82	MAB	JEM	WDE	ROB	CE	JCS	ADD DWGS & REVISE DATES	28
13	11-24-82	MAB	JEM	TC	ROB	CE	JCS	ADD DWG	30
14	1-4-83	MAB	JEM	TC	ROB	HH	JCS	ADD DWGS & DELETE DWGS	32
15	1-17-83	JHR	JEM	TC	ROB	HH	JCS	Add Dwg. to sheet 32	32
16	1-21-83	JHR	JEM	TC	ROB	HH	JCS	ADD DWG	32

Work Request No. N/A
Field Materials as follows:

Additional Information

Chief, Cost Planning and Control Staff, W12C74 C-K
Chief, Architectural Design Branch, W4C126 C-K
Chief, Civil Engineering Branch, W9D22- C-K
Chief, Civil Engineering & Design Branch, W3C126 C-K
Plant Superintendent
Chief, Electrical Engineering Branch, W8C126 C-K
Chief, Electrical Engineering & Design Branch, W2D22- C-K
Chief, Mechanical Engineering & Design Branch, 102 SPT-K
MEDS, 100 UB-K
ARMS, 640 CST2-C
Construction Project Manager

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2576
DATA SHEET NO. 2

PAGE 2A

AFFECTED UNIT	DRAWING OR SKI NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINK UPDATE ON DATA - % REV. NO.
1&2	47N400-211	1	4-82	5-27-82	MAIN STEAM	9
2	47W435-221	0	4-82	7-9-82	SIS	9
1	0600200-07-05	902	4-82	5-27-82	SGBD	9
~~1+2~~	~~47W430-225~~		~~4-30-82~~		DELETE	19 9
~~2~~	~~-234~~		~~4-30-82~~		DELETE	19 9
1+2	47W400-208	2		4-28-82		9
~~1+2~~	~~47W429-218~~		~~4-30-82~~		DELETE	19 9
~~1~~	~~47B429-504~~					19 9
~~1~~	~~-505~~					19 9
~~1~~	~~-506~~					19 9
~~1~~	~~-509~~					19 9
1	0600200-04-08	902	4-30-82	4-28-82		9
1+2	47W465-202	1		4-28-82		9
1	47W465-204	0		5-12-82		9
	47W464-240	5		5-27-82		
	0600200-06-01	902		5-27-82		
	0600200-13-03	902		5-27-82		

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2526
DATA SHEET NO. 2

BRANCH [ ]
PAGE 1

To: Watts Bar Nuclear Plant, Spring City, Tn

Design Project Manager — SVP 204-68-K

Released By: [signature] Design Project Manager

JAN 13 1981

(R3) SWP '82 0427 552

ring Section			
MECH. ANAL. #5	R0 SWP '81 0113 537	R4 SWP '81 0929 560	
Prepared By: T. J. MEANS			
Total Pages (RO): 11	R1 SWP '81 0515 522	R5 SWP '81 1106 540	
Section Supervisor: V. Dennis Lee			
Staff Eng. or Architect: E. D. Manning	R2 SWP '81 0624 520	R6 SWP '82 0109 520	
Group Head: W. A. English			
Branch Chief: R. O. Smith 10-27-80 Date	R3 SWP '81 0918 534	R7 SWP '82 0226 540	

SCOPE

Project WATTS BAR NUCLEAR PLANT — Affected Units 1&2

System or Feature ALL CEB'S ISSUED ISOMETRIC DRAWINGS

Reference & Description of Change Revise isometric drawings to include support hanger numbers.

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
1	5-15-81	TJM	VDL	WAE	ROB	FSM	[illegible]	Deleted dwgs.	11
2	6-29-81	CDC	VDL	WAE	ROB	FSM	[illegible]	Deleted & added dwgs	16
3	9-7-81	CDC	VDL	WAE	ROB	FSM	[illegible]	ADDED & DELETED DWG'S & CHANGED [illegible]	16
4	9-25-81	CDC	VDL	WAE	ROB	FSM	[illegible]	DELETE DWG	16
5	10-28-81	J.P.	VDL	WAE	ROB	FSM	[illegible]	DELETED DWGS ON Pgs. 9, 10, 13. AND [illegible]	16
6	1-9-82	RTB	VDL	WAE	ROB	FSM	[illegible]	ADDED DRAWINGS ON PP 16 & 17	17
7	2-26-82	WHL	VDL	WAE	ROB	LGP	[illegible]	DELETED DWGS ON SHTS 14, 15, 17; ADDED DWGS	18
8	4-29-82	WHL	VDL	WAE	ROB	LGP	[illegible]	ADDED DWGS TO SHT 18, 19	19

No. _____

J Materials as follows:

Additional Information:

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 10570A (EN DES-6-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2576
DATA SHEET NO. 2

PAGE 2

AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE ACTUAL	REMARKS	LINE UP DWG DAT. REV.
1 & 2	47W440-200 NS-1-1A			MAIN STEAM -1	
"	" -201 1A				
"	" -202 1A				
"	" -204 2A	5	1-30-82		
"	" -205 2A	2			
"	" -206 4A			DELETE	19
"	" -380 AUX				19
"	" -381 AUX				19
"	" -382 AUX				19
"	" -383 AUX				19
1 & 2	47W427-200 NS-3-2A			AUX Feedwater -38	
"	" -201 11A				
"	" -202			DELETE	
"	" -203				
"	" -204				
"	" -205				
"	" -206				
"	" -207				
"	" -208 15A			DELETE DWGS	
"	" -209				
"	" -210				
"	" -211				
"	" -212 4A				
2	" -213 6A				
2	" -214 8A			DELETE	
1 & 2	" -215 11A				
"	" -216 13A				
"	" -217				
"	" -218 15A, 16A				
~~1 & 2~~	~~47W427-209 15A, 16A~~		~~1-30-82~~	DELETE AUX FEEDWATER	
2	47W427-213 6A	1	9-8-82		
~~2~~	~~47W427-214 8A~~			DELETE	19
~~1 & 2~~	~~47W427-218 15A, 16A~~			DELETE	19

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2876
DATA SHEET NO. 2

PAGE 3

128-3182

ED	DRAWING OR S/M NUMBER	DWG REV.	DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1&2	47W491-200	5	3-1-82	Aux Boiler - 12	3
"	" -201	5	3-1-82		3
"	" -202	4	2-19-82		3
1&2	47W491-200			DELETE HPFP 26	3
"	" -201			DELETE	3
"	" -202			DELETE 19	3
"	" -203	5	6-23-81		3
"	" -204	4			3
"	" -205	4			3
"	" -206	4			3
"	" -207	1			3
"	" -208	1	3-31-82 2-19-82		3
"	" -209	1			3
"	" -210	1	6-21-82		3
"	" -211			DELETE 4	3
1&2	37W206-200	3	7-29-82		3
"	" -201	4	7-29-82		3
1&2	47W915-100			DELETE Air Cond. - 31	19
	47W915-101			DELETE	19
1&2	47W492-200	2	4-8-82	Raw Cooling Water - 24	3
"	47W492-201	1		DELETE Primary Make up Wtr - 81	3
"	47W492-202	2	12-14-81		3

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. _____
DATA SHEET NO. _____

BRANCH _____

PAGE 1

To: _____

From: Design Project Manager _____ Released By: _____ Design Project Manager

Date: _____

Preparing Section		MEDS Accession No.	MEDS Accession No.
Prepared By:	RO		R4
Total Pages (RO):	R1		R5
Section Supervisor:	R2		R6
Staff Eng. or Architect:	R3		R7
Group Head:			
Branch Chief: Date			

SCOPE

Project _____ Affected Units _____

System or Feature _____

Reference & Description of Change _____

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES

Reqn. No. _____
Field Materials as follows:

Additional Information:

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 10678A (EN DES-6-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2626
DATA SHEET NO. L

PAGE 4

ED	DRAWING OR S/M NUMBER		DWG REV.	DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1 of 2	47W406-200			9-14-81	LP-CVCS - 628	3
"	47W406-201	-3A		9-14-81		3
"	47W406-202	-3A	3	9-14-81		3
"	47W406-203	-1A	8	3-9-82		3
"	47W406-204	-1A	5	3-9-82		3
"	~~47W406-205~~	~~-2A,3A~~			DELETE	19
"	47W406-206	-2A,3A	5	3-26-82		3
"	~~47W406-207~~	~~-3A,8A~~			DELETE	19
"	~~47W406-208~~	~~-11K~~			DELETE	19
"	47W406-301					
"	47W406-302	-2K				3
"	47W406-303	-3K				3
"	47W406-304	-4K				3
"	47W406-305	-6K				3
"	47W406-306	-7K				3
	47W406-307	-8K				3
"	47W406-308	-9K				3
"	47W406-309	-5K				3
"	47W406-310	-5K				3
"	47W406-311	-10K				3
"	47W406-312	-10K				3
"	47W406-313	-15K				3
"	47W406-314	-17A				3
					DELETE	
				11-30-82		
1 of 2	~~47W555-200~~	~~N3-62-1A~~			DELETE HP-CVCS - 628	3
"	47W555-201	-10A		1-30-82		3
"	47W555-202	-10A	7	12-28-82		3
"	47W555-203	-5A	3	12-31-81		3
"	47W555-204	-5A	2	12-14-81		3
	47W555-205	-9A	1	12-14-81		3
	~~47W555-206~~	~~-7A~~		DELETE		3
"	~~47W555-207~~	~~-12A,14A~~		DELETE		3
"	~~47W555-208~~	~~-13A,15A~~		DELETE		3
"	47W555-209	-20A	6	1-30-82		3

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. _____
DATA SHEET NO. _____

BRANCH

PAGE 1

To: _____

From: Design Project Manager _____ Released By: _____
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Date: _____

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SCOPE

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Chief, Electrical Engineering & Design Branch, W2D224 C-K
Chief, Mechanical Engineering & Design Branch, 102SPT-K
MEDS, E4B37 C-K

TVA 16678A (EN DES-D-78)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2876
DATA SHEET NO. 2

PAGE 5

ED	DRAWING OR S/M NUMBER	DWG REV.	DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1, 2	47W555-210 -13A		2-10-82	HP-CVCS-62A	3
"	47W555-211 -13A		1-30-82		3
"	47W555-212 -13A	3	2-10-82		3
"	47W555-213 -13A	5	2-10-82		3
"	~~47W555-214 -3R~~			Delete	1
"	~~47W555-215 -3R~~				1
"	~~47W555-216 -12R~~				1
"	~~47W555-217 -13R~~				1
"	~~47W555-218 -14R~~				1
"	~~47W555-220 -3A~~				1
1+2	47W435-208 N3-63-1A -3A	4	1-30-82	DELETE SIS -63	3
"	47W435-212 -3A		1-30-82		3
	~~47W435-215 -3A~~		DELETE		3
	47W435-206 -7A	5	9-24-82		3
"	47W435-207 -7A	6	9-24-82		3
"	47W435-208 -7A	3	9-24-82		3
"	47W435-209 -7A	6	9-24-82		3
"	47W435-210 -7A	6	9-24-82		3
"	47W435-211 -7A	2	9-24-82		3
"	47W435-212 -2A				3
"	47W435-213 -2A		DELETE		3
"	47W435-214 -4A				3
"	47W435-215 -4A				3
1+2	47W462-110 N3-61-1R, 2R	4	2-19-82	Ice Condenser -61	3
L	~~47W450-200 N3-67-2A~~		DELETE	ERCW -67	3
"	47W450-201 -2A	6	5-28-81		3
"	~~47W450-202 -2A~~		DELETE		3
"	47W450-203 -2A			DELETE 19	3

12/30/82

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. _____
DATA SHEET NO. _____

BRANCH

PAGE 1

To: _____

From: Design Project Manager _____ Released By: _____ Design Project Manager

Date: _____

Preparing Section	MEDS Accession No.		MEDS Accession No.	
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Total Pages (RO):	R1		R5	
Section Supervisor:	R2		R6	
Staff Eng. or Architect:	R3		R7	
Group Head:				
Branch Chief: Date				

SCOPE

Project _____ Affected Units _____

System or Feature _____

Reference & Description of Change _____

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES

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Chief, Electrical Engineering & Design Branch, W2D224 C-K
Chief, Mechanical Engineering & Design Branch, 102SPT-K
MEDS, E4B37 C-K

TVA 10878A (EN DES-6-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2576
DATA SHEET NO. 2

PAGE 6

TED T	DRAWING OR S/M NUMBER	DWG REV.	[illegible]	DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
	NS-67-3A			9-24-81	ERCW	-67 3
1 + 2	47W450-204					
"	47W450-205 -3A, 3R			9-3-82		
"	47W450-206 -3A	4		4.8.82		
"	-3A			DELETE		
"	-2A	8		5-27-81		
"	47W450-209 -9A	5		9-23-82		
"	47W450-211 -9A	5		9-23-82		
"	47W450-212 -9A	7		9-23-82		
"	47W450-213 -9A	7		9-24-81		
"	47W450-214 -9A	5		1-13-81		
"	47W450-215 -9A	4		9-23-82		
"	47W450-216 -19A, 30A	8		11-24-81		
"	47W450-217 -19A	5		7-17-82		
"	47W450-218 -19A	8		7-17-82		
"	47W450-219 -19A	4		5-27-81		
	47W450-220 -19A	5		7-20-81		
1 + 2	47W450-221 -2A	4		5-27-81		
"	47W450-223 -10A	2		3-1-82		
"	47W450-224 -9A	8		9-23-82		
"	47W450-225 -7A	1		4-29-82		
"	47W450-226 -8A	1		8-26-81		
"	47W450-227 -11A	1		5-27-81		
"	47W450-228 -12A	1		11-24-81		
"	47W450-229 -13A	5		8-11-81		
"	47W450-230 -9A	3		7-20-81		
"	47W450-231 -9A					
1 + 2	47W450-232 -19A				DELETE	
"	47W450-233 -15A					
"	47W450-234 -16A					
"	47W450-235 -17A					
"	47W450-236 -18A					
	47W450-237 -3R	3		6-23-81		
"	47W450-238 -9R				DELETE	19
"	47W450-239 -1,2,8,9R					19
"	47W450-240 -3,8A,7R					19
"	47W450-241 ?					19

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. _____
DATA SHEET NO. _____

BRANCH

PAGE 1

To: _____

From: Design Project Manager _____

Released By: _____
Design Project Manager

Date: _____

Preparing Section	MEDS Accession No.		MEDS Accession No.	
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SCOPE

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Chief, Mechanical Engineering & Design Branch, 102SPT-K
MEDS, E4B37 C-K

TVA 10878A (EN DES-6-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2826
DATA SHEET NO. 2

PAGE 7

ED	DRAWING OR S/M NUMBER	DWG REV	[redacted]	DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.	
1+2	47W206-300 NS-67-2A R5	[redacted]	[redacted]	6-23-82	FRCW (IPS)	67	3
1+2	47W465-200 NS-68-1A	[redacted]	[redacted]	3-31-82 2-10-82	Reactor Coolant-68		3
"	~~47W465-201~~ -2A	[redacted]	[redacted]		DELETE	19	3
"	47W465-202 -2A	0		2-17-82			3
"	~~47W465-203~~ -3K				Delete		1
"	~~47W465-204~~ -4K						1
1+2	47W464-200 NS-70-1A	[redacted]	[redacted]		DELETE Component Cooling-70		3
"	47W464-201 -2A	3	12/30/82	3-19-82			3
"	47W464-202 -2A	3		3-17-82			3
"	47W464-203 -2A	2		3-19-82			3
"	~~47W464-204~~ -5A			DELETE			3
	~~47W464-205~~ -6A			DELETE			3
"	~~47W464-206~~ -3A			DELETE			2
"	47W464-207 -3A	6	3-31-82	3-17-82			3
"	47W464-208 -3A	6		3-17-82			
"	47W464-209 -3A	5		2-10-82 2-10-82			
"	47W464-210 -3A	4		2-17-82			
"	47W464-211 -3A	4	3-3-82	3-17-82			
"	~~47W464-212~~ -4A,9A,10A		[redacted]		DELETE	19	
"	~~47W464-213~~ -4A					19	
"	~~47W464-214~~ -4A					19	
"	~~47W464-215~~ -4A					19	
"	47W464-216 -9A	4		4-28-82			
"	47W464-217 -9A	3		4-28-82			
"	~~47W464-218~~ -4A				DELETE	19	
"	47W464-219 -10A	2		4-8-82			
"	47W464-220 -10A	2	[redacted]	3-19-82			
"	~~47W464-221~~ -4A				DELETE	19	
"	~~47W464-222~~ -7A				DELETE	19	
"	47W464-223 -8A	4		3-9-82			
"	~~47W464-225~~ -3A,12A			DELETE			
"	47W464-226 -12A	3		1-28-82			

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. _____
DATA SHEET NO. _____

BRANCH

PAGE 1

To: _____

From: Design Project Manager _____ Released By: _____ Design Project Manager

Date: _____

Preparing Section	MEDS Accession No.		MEDS Accession No.	
Prepared By:	R0		R4	
Total Pages (RO):	R1		R5	
Section Supervisor:	R2		R6	
Staff Eng. or Architect:	R3		R7	
Group Head:				
Branch Chief: Date				

SCOPE

Project _____ Affected Units _____

System or Feature _____

Reference & Description of Change _____

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES

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Chief, Electrical Engineering & Design Branch, W2D224 C-K
Chief, Mechanical Engineering & Design Branch, 102SPT-K
MEDS, E4B37 C-K

TVA 10675A (EN DES-6-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2576
DATA SHEET NO. 2

PAGE 8

ED	DRAWING OR S/M NUMBER	DWG REV.	ENGINEERING DATE	ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
	~~47W464-227~~ N3-70-38A, 39A				DELETE Component Cooling - 70	3
1 & 2	~~47W464-228~~ -26A, 33A					3
"	~~47W464-229~~ -34A, 37A					3
"	~~47W464-230~~ -29A, 30A					3
"	~~47W464-231~~ -27A					3
"	~~47W464-232~~ -31A					3
"	~~47W464-233~~ -28A					3
"	~~47W464-234~~ -35A					3
"	47W464-235 -3A	4		3-17-82		3
"	~~47W464-236~~ -1R				DELETE	3
"	~~47W464-237~~ -2R					3
"	~~47W464-238~~ -3R					3
"	~~47W464-239~~ -1R					3
	47W464-228 -26A, 33A	2	~~3-31-82~~ ~~1-30-82~~	3-17-82		3
2	47W437-200 N3-72-3A	~~5~~	~~1-30-82~~ ~~2-27-81~~	2-17-82	Containment Spray - 72	3
"	47W437-201 -1A	~~4~~		11-13-81		3
"	47W437-202 -1A	4		11-13-81		3
"	47W437-203 -1A	6		11-13-81		3
"	47W437-204 -3A, 6A	6	3-31-82	2-19-82		3
"	~~47W437-205~~ -4A				DELETE	3
			~~1-30-82~~ ~~2-27-81~~	dw/11		
1 & 2	47W432-200 N3-74-1A	7		5-27-81	RHR - 74	
"	47W432-201 -1A	5	3-31-82	3-8-82		3
"	47W432-202 -1A	4	3-30-82	4-29-82		3
"	47W432-203 -1A	2		4-29-82		3
"	~~47W432-204~~ -1A				DELETE 19	3
"	47W432-205 -2A	5		2-19-82		3
"	47W432-206 -3A	6		4-8-82		3
			~~3-31-82~~ ~~1-30-82~~			
2	47W454-200 N3-78-1A-1-2	4	~~2-27-81~~	6/12/81 3-31-82	Fuel Pool Cleaning - 78	
"	47W454-201 -1A-1-2	2	3-31-82	~~3-31-82~~ 2-10-82 RO		3
"	47W454-202 -4A	2		3-9-82		3
"	47W454-203 -3A	4		3-5-82		3

TENNESSEE VALLEY AUTHORITY
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BRANCH

PAGE 1

To: _____

From: Design Project Manager _____ Released By: _____ Design Project Manager

Date: _____

Preparing Section		MEDS Accession No.		MEDS Accession No.
Prepared By:		RO	R4	
Total Pages (RO):		R1	R5	
Section Supervisor:		R2	R6	
Staff Eng. or Architect:		R3	R7	
Group Head:				
Branch Chief: Date				

SCOPE

Project _____ Affected Units _____

System or Feature _____

Reference & Description of Change _____

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES

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Field Materials as follows:

Additional Information:

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 10878A (EN DES-6-79)

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UNIT	DRAWING OR S/M NUMBER	DWG REV.		DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1 & 2	47W454-204 NS-78-5A			3-9-82	Fuel Pool Cleaning -78	3
"	~~47W454-205~~ -8A				DELETE	3
"	~~47W454-206~~ -9A				DELETE	3
"	47W454-207 -6A	1	3-31-82	3-1-82		3
"	47W454-208 -1A	1		~~3-30-82~~ 2-28-82		3
"	~~47W454-209~~ -7A				DELETE	3
"	47W454-210 -2A	1		2-8-82		3
1 & 2	47W435-250 NS-87-1A			~~3-9-82~~	UHI DELETE 87	3
1 & 2	47W600-400 NS-90-2A	1	1-30-82	1-30-82	Instrumentation - 90	3
"	47W600-401 -3A			1-30-82		
"	47W600-402 -5A	1		1-30-82		
	47W600-403 -6A	2		1-30-82		
	47W600-404 -2A	1		1-30-82		
"	47W600-405 -3A	1		1-30-82		
"	47W600-406 -5A	1		1-30-82		
"	47W600-407 -6A	2		1-30-82		
1	~~0600200-02-05~~		1-30-82		DELETE Feedwater 78	3
	~~0600200-02-06~~				DELETE	3
	~~0600200-02-07~~				DELETE	3
	~~0600200-02-08~~				DELETE	3
	~~0600200-02-09~~					3
	~~0600200-02-10~~					3
	~~0600200-02-11~~					3
	~~0600200-02-12~~					3
	~~0600200-04-01~~				DELETE Component Cooling 70	3
	~~0600200-04-02~~					3
	~~0600200-04-04~~					3
	~~0600200-04-05~~					3
	~~0600200-04-10~~					9
	~~0600200-05-01~~				Aux Feedwater 38	3
1	~~0600200-05-02~~					3

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BRANCH

PAGE 1

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From: Design Project Manager _____ Released By: _____
Design Project Manager

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Preparing Section	MEDS Accession No.		MEDS Accession No.	
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SCOPE

Project _____ Affected Units _____

System or Feature _____

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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 10675A (EN DES-6-79)

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DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
0600200-06-01				DELETE	3
0600200-06-02				Main Steam	3
0600200-06-03					3
0600200-06-04					3
0600200-07-01				Steam Gen Bldg 19	3
0600200-07-02					3
0600200-07-04					3
0600200-08-05				EMCS 62	3
0600200-08-06					3
0600200-08-08				DELETE 19	3
0600200-08-09				DELETE 19	3
0600200-08-10				DELETE	3
0600200-08-11					3
0600200-08-13				DELETE 19	3
0600200-08-14	2		1-28-82		3
0600200-08-15	2		1-28-82		3
0600200-08-16				DELETE	3
0600200-08-17				DELETE 19	3
0600200-09-04				DELETE SIS 69	3
0600200-09-05					3
0600200-09-06					3
0600200-09-10					3
0600200-09-11					3
0600200-10-01				Instrumentation	3
0600200-10-02					3
0600200-10-03					3
0600200-13-01					3
0600200-13-02				Reactor Coolant 68	3
0600200-13-04					3
0600200-13-05					3
0600200-13-06					3
0600200-13-07					3
0600200-13-08					3
0600200-13-09					3
0600200-13-10					3

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BRANCH

PAGE 1

To:

From: Design Project Manager

Released By: Design Project Manager

Date:

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Branch Chief: Date				

SCOPE

Project

Affected Units

System or Feature

Reference & Description of Change

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES

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Field Materials as follows:

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Chief, Civil Engineering & Design Branch, W3C126 C-K

Chief, Electrical Engineering & Design Branch, W2D224 C-K
Chief, Mechanical Engineering & Design Branch, 1B2SPT-K
MEDS, E4B37 C-K

TVA 10675A (EN DES-6-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

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DATA SHEET NO. 2

PAGE N

	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.	
1	~~0600250-13-11~~		~~2-14-82~~		Reactor Coolant	6R	1
	~~0600250-13-12~~		~~2-14-82~~				1
	~~0600250-13-04~~		~~2-14-82~~		UHI	87	1
	~~0600250-13-05~~		~~2-14-82~~				1
	~~0600250-04-02~~		~~12-30-82~~				
2	~~0600250-04-03~~		~~1-30-82~~		DELETE Component Cooling	10	3
2	~~0600250-04-04~~		~~1-30-82~~		DELETE	28	3
	~~0600250-04-05~~		~~1-30-82~~		DELETE		3
2	0600250-04-06	903	~~1-30-82~~ 2-4-82	5-12-82			3
2	0600250-04-07	902	~~1-30-82~~ 2-4-82	5-12-82			3
	~~0600250-04-08~~		~~1-30-82~~		DELETE		3
2	0600250-04-09		~~1-30-82~~		DELETE	19	3
	~~0600250-04-10~~		~~1-30-82~~		DELETE		3
2	0600250-04-11	903	~~1-30-82~~ 3-31-82	5-12-82			3
	~~0600250-07-02~~		~~3-31-82~~	~~2-4-82~~	DELETE Steam Gen. Blowdown	10	3
	0600250-08-03	904	~~1-30-82~~ 3-31-82	~~2-4-82~~ 2-10-82	CVCS	62	3
	~~0600250-08-06~~		~~1-30-82~~ 4-30-82		DELETE	19	3
	0600250-08-07	1		1-30-82			3
	0600250-08-13	1		1-30-82			3
	0600250-08-14	1		1-30-82			3
	0600250-08-15	1		1-30-82			3
	0600250-08-16	1		1-30-82			3
	0600250-08-17	1		1-30-82			3
	0600250-08-18	1		1-30-82			3
	~~0600250-15-01~~		~~2-4-82~~		DELETE UHI	19 87	3
2	0600250-15-02		~~2-4-82~~			19	3

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From: Design Project Manager _____ Released By: _____
Design Project Manager

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Branch Chief: Date				

SCOPE

Project _____ Affected Units _____

System or Feature _____

Reference & Description of Change _____

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REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES

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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 10975A (EN DES-6-79)

TVA 10575E (EN DES-7-79)

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AFFECTED UNIT	DRAWING OR S/M NUMBER	CWD REV.	[redacted]	DATE ACTUAL	REMARKS	LINE UP W/ ON DATA S REV. NO.
1	47W427-200	4	[redacted]	1-30-82	AUX Feedwater	
1	201	4	3-31-82	3-1-82		
1	202	5	2-26-82	2-10-82		
~~1~~	~~203~~		~~[redacted]~~		DELETE	19
~~1~~	~~204~~					
~~1~~	~~206~~					
~~2~~	~~208~~					
~~2~~	~~209~~					
~~2~~	~~210~~					
2	211	2		3-19-82		
1	212	2		1-15-82		
1	215	2	[redacted]	2-10-82		
~~2~~	~~216~~		~~3-31-82~~		DELETE	19
~~2~~	~~217~~				DELETE	19
1	47W491-200	5		1-30-82	HPFP	
~~2~~	~~201~~		[redacted]		DELETE	19
2	211	1	[redacted]	4-8-82		
~~1~~	~~47W406-301~~	3		~~3-19-82 EP~~	DELETED CVCS	19
1	302	3	[redacted]	3-26-82		
1	303	5	4-30-82	11-15-82		
1	304	4		9-24-82		
~~2~~	~~305~~	3	~~4-30-82~~	~~3-19-82 EP~~	DELETE	19
~~2~~	~~306~~	3		~~3-19-82 EP~~		19
~~2~~	~~307~~	3		~~3-19-82 EP~~		19
~~2~~	~~308~~	3		~~3-19-82 EP~~		19
1	309	3		1-30-82		
1	310	1	[redacted]	4-29-82		
2	311	1		~~3-19-82 EP~~		
2	312	1		4-8-82		
2	313	2	4-30-82	4-29-82		
2	314	1		4-28-82		
1	47W555-200	5	3-31-82	~~3-31-82 EP~~	HPCVCS	
2	206	5		2-10-82		
1	207	5		1-30-82		
2	208	7		12-30-81		
1	47W435-200	8	3-31-82	3-1-82	515	

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AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	DATE ACTUAL	REMARKS	LINE L ON DRT REV. #
1	47W435-205	4	4-8-82	SIS	
~~2~~	~~218~~			~~DELETE~~	19
2	213	2	6-22-81		
~~2~~	~~219~~			~~DELETE~~	19
~~2~~	~~215~~				19
~~1~~	~~47W498-200~~			ERCW	19
~~2~~	~~202~~				19
~~2~~	~~47W450-207~~			ERCW DELETE	19
~~2~~	~~230~~			~~DELETE~~	19
1	231	3	11-13-81		
~~2~~	~~232~~			~~DELETE~~	19
~~2~~	~~233~~			~~DELETE~~	19
2	234	3	6-22-81		
2	235	3	4-15-82		
2	236	2	4-15-82		
1	47W464-204	5	2-17-82	Component Cooling	
~~2~~	~~203~~			~~DELETE~~	14
1	225	3	2-17-82		
~~2~~	~~227~~			~~DELETE~~	14
~~2~~	~~229~~			~~DELETE~~	14
1	230	4	2-17-82		
1	231	2	3-1-82		
~~2~~	~~232~~			~~DELETE~~	19
1	233	4	3-19-82		
~~2~~	~~234~~			~~DELETE~~	19
2	236	2	6-22-81		
2	237	2	1-30-82		
2	238	2	1-30-82		
2	239	2	7-11-82		
~~2~~	~~47W437-205~~			~~DELETE~~ Spray	19
~~2~~	~~47W454-205~~			Fuel Pool Cleanup	19
~~2~~	~~206~~				19
~~1~~	~~209~~				19
~~1&2~~	~~0600200-02-09~~		~~DELETE~~	~~Feedwater~~	
	~~02-08~~		~~DELETE~~		
	~~02-09~~			~~DELETE~~	1

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AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE	ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1&2	0600200-02-10	11		1-15-82	Feed water	3
	11				DELETE	19
	12				DELETE	19
	05-01				DELETE Aux. Feedwater	
	02				DELETE	
	0600200-06-01 1/2	902		6-22-82	(Sh 1 of 2) Main steam	
	06-02	902		3-1-82		
	06-03	902		5-12-82		
	06-04	2		1-30-82		
	07-01			DELETE	Steam Gen Blowdown	
	07-03			DELETE		
	07-04			DELETE		
	08-05				DELETE CVCS	19
	08-09	902				
	08-10				DELETE	19
	08-11	902		5-24-82		
	09-04	1		1-28-82	SIS	
	09-05			DELETE		
	09-06			DELETE		
	09-10	2		1-30-82		
	09-11	903	3-31-82	2-1-82		
	10-01	901	4-30-82	4-28-82	INST	
	10-02	901		4-28-82		
	10-03	901		4-28-82		
	13-01	1	4-30-82	1-30-82	React Coolant	
	1302	902		9-10-82		
	13-04	901		4-29-82		
	13-05	902	3-31-82			
	13-06				DELETE	19
	13-07				DELETE	19
	13-08	1		2-10-82		
	13-09				DELETE	
	13-10				DELETE	19
	13-11					19
	13-12					19
	-04	901			UHI	

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AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE ACTUAL	REMARKS	LINE I ON CAT REV. NO
1&2	0600200-15-05	1	2-10-82	UHI	
	~~02-01~~		DELETE		
	~~02-02~~				
	~~02-03~~				
	~~02-04~~				
	03-01	1	1-30-82	RHR	
1	04-03	2	1-30-82	Comp. Cooling	
	04-06	3	2-2-82		
	~~04-07~~			DELETE	19
	~~04-08~~		DELETE		
	04-09	2	1-30-82		
	09-11			DELETE	19
	~~07-02~~		DELETE	Steam Gen Bd.	
1&2	~~07-05~~		DELETE		
1	~~08-01~~		DELETE	CVCS	
	08-02	2	2-10-82		
	~~08-04~~		DELETE		
	~~08-07~~			DELETE	19
1&2	~~08-12~~				19
1	~~08-18~~				19
1&2	09-01	903	2-11-82	SIS	
1	~~09-02~~			DELETE	19
1&2	09-03	902	6-21-82		
	~~09-07~~			DELETE	19
	09-08	901			
	09-09	902			
	~~13-03~~			DELETE Reactor Coolant	19
1	15-01	1	2-17-82	UHI	
	15-02	8	2-9-82		
1&2	~~15-03~~		DELETE		
	~~06-01~~			DELETE Main Steam	19
2	0600250-09-02	902	8-3-82	SIS	
2	08-01	2		CVCS	
2	08-02	902	3-31-82		
2	08-04	1			
1	47W464-240	4	1-30-82	Comp Cooling	

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AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1+2	47W450-210	6	~~11-30-81~~ ~~11-30-81~~	11-13-81	ERCW	3
	47W400-209				~~INST~~ DELETE	19 3
	47W491-212	0		6-23-81	PROTECTION & MAKEUP WATER SYS.	2
	~~0600200-04-01~~		~~11-30-81~~		COMPONENT COOLING TO Aux. Bldg	3
	" 04-02	2	~~11-30-81~~	11-24-81		3
	" 04-04				DELETE	19 3
	" 04-05					19 3
	" 04-10	904				19 3
	" 09-05					19 3
1	47W406-315	0	11-30-82	10-15-81	CVCS	3
1	" -316	0		11-5-81	"	3
1+2	47W435-251	0		11-6-81	SIS	3
1	47W406-317	0		10-28-81	CVCS	3
1	47W464-242	0	~~3-31-82~~	~~4-28-82~~ 4-28-82	CCWS	3
	47W400-211	0		11-13-81	SGBD	3
	" 210	0		12-31-81	"	3
	" 209	1	~~4-30-82~~	4-28-82	"	3
	" 208	0		11-6-81	"	3
1+2	47W435-216	0		10-15-81	SIS	3
	" -217	0		10-30-81	"	3
1+2	47W401-208	0		12-31-81	FEEDWATER	3
	" 209	0	~~11-30-82~~		"	3
	" 210	0			"	3
	" 211	0			"	3
~~2~~	~~47W435-218~~		~~11-30-82~~		~~09-06 UNIT 2 DELETE~~	5
1	47W406-319		10-31-81	10-26-81	08-16 UNIT 1	5
1+2	47W401-212	0	1-15-82	~~12-31-81~~	FEEDWATER 02-05	5
	" 213	1	~~3-31-82~~	5-12-82	" 02-06	5
	" 214	0		1-28-82	" 02-07	5
	" 215	0	3-31-82	2-19-82	" 02-08	5
1+2	47B401-408	0	1-10-82	1-28-82	02-05	6
	-409	0		1-28-82		6
	-410	0		1-28-82		6
	-411	0	3-31-82	2-19-82	02-06	6
	-412	0				6

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AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE		REMARKS	LI. ON ✓ REV. NO.
			EXPECTED	ACTUAL		

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AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
42	47B401-413	0	11-10-82	2-19-82	02-06	6
	414	0		1-28-82	02-07	
	415	0		1-28-82		
	~~416~~				DELETE	19
	417	0		2-19-82	02-08	
	418	0				
	419	0				
	420	0			02-08	
	421	0		1-28-82	02-05	
	422	0		1-28-82	02-07	
	423	0	3-31-82	2-19-82	02-08	
42	47B429-399				02-08 DELETE	19
	-468	1			02-05	19
	-490	1				19
	-475	1		1-28-82		
	47B450-587	1	11-10-82	12-31-81	N3-67-2A	
	-596	0				
	-597	0				
	-598	0				
	-599	0				
	-600	0				
	-601	0				
	-510	3				
	-509	2				
	-503	3				
	-501	2				
	-499	2				
	-498	2				
	-497	2				
	-496	2				
	~~47W450-200~~	4			DELETE	
	~~-202~~	4			DELETE	
	~~-204~~	4			DELETE	
42	47W435-216	1	2-28-82	2-10-82		7
42	47B450-579	1	3-31-82	3-1-82	ERCW	

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AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	DATE ~~PROJECTED~~	DATE ACTUAL	REMARKS	LINE I ON DA REV. N
1+2	47W464-242	0	~~2-28-82~~	4-9-82	COMPONENT COOLING	7
	47W427-209	4	4-30-82	4-28-82	AUX FEEDWATER	7
	~~0600200-02-01~~		~~2-28-82~~		~~FEEDWATER~~ DELETE	19
	~~-02-02~~				"	19
	~~02-03~~				"	19
	~~-02-04~~				"	19
	47W427-219				AUX FEEDWATER DELETE	7
↓	47W435-219	0		6-21-82	SAFETY INJECTION	7
~~2~~	~~47W406-200~~	~~4~~	↓	~~3-1-82~~	~~CVCS~~ DELETE	~~19~~ 7
	-201	5		1-30-82		7
	-202	4	12 4-30-82	~~3-1-82~~ 2-8-82		7
	~~-203~~		~~3-1-82~~		DELETE	19 7
	~~-205~~				DELETE	19 7
	-206	3		3-1-82		7
	-207	3		3-1-82		
↓	47W427-205		~~4-30-82~~		DELETE AUX FEEDWATER 19	
+	~~47W1486-315~~	*		~~2-10-82~~	~~CVCS~~ DELETE	19
1	-317	1		1-30-82	CVCS	
1&2	-320	0	~~2-28-82~~ 4-30-82	~~2-10-82~~ 2-11-82	CVCS	
	~~47B435-475~~		~~3-1-82~~		CVCS ~~DELETE~~ TABLES	
	~~-476~~					
	~~-477~~					
	~~-478~~					
	~~-479~~					
	~~-480~~					
	~~-444~~					
	~~-443~~					19
	47B465-359			2-17-82	REACT COOLANT LOAD TABLES	
	-360			2-17-82		
	-361			2-17-82		
	-362			2-17-82		
1+2	0600200-13-09	2	12-28-82	2-17-82	3-30-82	
~~1+2~~	~~47W435-216~~		~~2-28-82~~		SIS DELETE	A 18
	-217	1		3-1-82	SIS	8
	47W437-201	8		3-1-82	CONTAINMENT SPRAY	8
↓	-202	5		3-1-82	" "	8

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1+2	47W437-203	7	3-31-82	3-1-82	CONTAINMENT SPRAY	8
1	47W450-201	8		12-31-81	ERCW	8
	-229	6		2-19-82	ERCW	8
↓	0600200-13-01	902		3-1-82	REACTOR COOLANT	8
1	47B464-471	2	↓	3-1-82	CCS	8
1+2	47B465-363	0	3-3-82	3-17-82		3
↓	47W432-200	8		3-17-82		8
1+2	47W464-235	4	~~3-31-82~~	3-17-82		8
~~1+2~~	~~47W432-200~~		~~3-31-82~~		RHR DELETE	19
1	47W450-228	2		4-8-82	ERCW	
	-226	2		4-8-82	↓	
	-227	2		4-8-82	↓	
~~1~~	~~47B450-487~~		~~3-31-82~~		ERCW LOAD TABLES DELETED	19
	-593	2	↑	11-22-82	↓	
	-483	3		11-22-82	↓	
	-484	4		11-22-82	↓	
	~~-488~~				DELETE	19
	-489	2		11-22-82	↓	
	~~-490~~				DELETE	19
↓	-619	1		11-22-82	↓	
1+2	47W406-321	0		~~5-24-82~~ 11-22-82	CVCS	
~~2~~	~~47W435-221~~		↓		SIS DELETE	19
1+2	47W406-322	0	~~6-30-82~~	9-2-82		
	~~0600200-08-12~~				DELETE	19
	47B406-549	0		7-7-82		
	550	0		7-7-82		
	551	0		7-7-82		
	556	0		7-7-82		
	47W491-203	6		9-2-82		
	204	5		9-2-82		
	205	5		9-2-82		
	206	5		9-2-82		
	47B491-376	5		9-2-82		
	377	4		↓		
	378	5		↓		
	379	4	↓	9-2-82		

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AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE		REMARKS	LI[illegible] UP[illegible] ON DATA REV. NO
			EXPECTED	ACTUAL		

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AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UP TED ON DATA SHEET REV. NO.
1&2	47B491-380	5	8-30-82	9-2-82	N3-26-3A	
	381	3				
	382	5				
	383	3				
	384	4				
	385	5				
	386	3				
	387	5				
	388	5				
	389	3				
	390	3		9-2-82		
	391	3		9-2-82		
	392	3		9-2-82		
	393	2		9-2-82		
	394	3		9-2-82		
	395	2				
	396	3				
	397	3				
	398	2				
	399	2				
	400	2				
	401	3				
	402	3				
	403	3				
	404	3				
	405	3				
	406	3				
	422	1				
	423	1		9-2-82		
	47W435-206	5	2-30-83		DELETEN2-63-7A	19
	207	6				19
	208	3				19
	209	6				19
	210	6				19
	211	2				19
	47B435-365	3				19

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1 & 2	47B435-~~366~~	3	[illegible]		DELETED 2-637A	19
	~~367~~	3				
	~~368~~	4				
	~~369~~	3				
	~~370~~	5				
	~~371~~	3				
	~~372~~	3				
	~~373~~	3				
	374	3				
	~~375~~	3				
	~~376~~	3				
	~~377~~	3				
	~~378~~	3				
	380	2				
	~~410~~	1				
	387	3				
	~~388~~	3				
	~~384~~	2				
	~~383~~	3				
	~~382~~	2				
	381	3				19
1	491	0		9-9-82	09-02	
	492	0		9-9-82		
	493	0		9-9-82		
	494	0		9-9-82		
	406	2		9-9-82		
	445	1		9-9-82		
	446	1		9-9-82		
	484	0		9-9-82		
	485	0		9-9-82		
	486	0		9-9-82		
	487	0		9-9-82		
	488	0		9-9-82		
	489	0		9-9-82		
	490	0		9-9-82		
	0600200-09-02	9		9-9-82	09-02 (VOIDED DWG)	

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AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UP TO ON DATA REV. NO.
1	47W435-222	0	8-30-82	9-24-82	09-02	
1 & 2	47W464-213	4		9-2-82	N3-70-4A	
	214	3				
	215	4				
	218	5				
	221	4				
	47B464-474	2		9-2-82		
	416	2		9-2-82		
	417	3		9-2-82		
	418	3		9-2-82		
	419	3		9-2-82		
	420	3		9-2-82		
	421	3		9-2-82		
	422	3				
	423	2				
	424	3				
	425	3				
	426	3				
	427	3				
	499	2				
	428	3				
	429	3				
	430	3				
	431	3				
	432	3				
	485	2				
	486	2				
	487	1				
	488	2				
	489	1				
	490	2				
	492	X1				
	491	2				
	493	2				
	494	1				
	495	1		9-2-82		

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FECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UP ON DAT? REV. NO.
1 2	47B464-496	2	8-30-82	9-2-82	N3-70-4A	
	497	2		9-2-82		
	498	2		9-2-82		
	~~499~~				DELETE	19
	563	1		9-2-82		
1 2	47W406-205	6		9-8-82	N3-62-29A	
	~~-206~~				N3-62-30A DELETE	19
	47B406-554	0		9-8-82	N3-62-30, -29A	
	382	3		9-8-82		
	557	0		9-8-82		
	393	2		9-8-82		
	553	0		9-8-82		
	390	3		9-8-82		
	552	0		9-8-82		
	400	1		9-8-82		
	401	2		9-8-82		
	389	3		9-8-82		
	397	2		9-8-82		
	47W427-205	5		7-28-82	N3-3-1A, 2A, 9A	
	206	4		7-28-82		
	47B427-512	0		7-28-82		
	513	0				
	516	0				
	515	0				
	514	0		7-28-82		
	47W427-218	0		9-24-82	0600200-05-01	
	0600200-05-01	901		7-17-82		
	47B427-506	0		9-24-82		
	505	0		9-24-82		
	504	0		9-24-82		
	~~504~~	~~0~~	~~2-30-83~~		DELETE	19
	47W427-204	2		9-2-82	N3-3-5A	
	220	0		9-2-82		
	47B427-387	3		9-2-82	N3-3-7A	
	388	3		9-2-82		
	452	1		9-2-82		

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AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	47B427-386	1	~~8-30-82~~	9-2-82	N3-3-5A	
	384	1		9-2-82		
	385	1		9-2-82		
1 2	47W464-244	0		7-28-82	04-04	
	0600200-04-04	2		7-17-82		
	47B464-619	0		7-28-82		
	620	0				
	617	0				
	618	0				
	613	0				
	616	0				
	614	0				
	615	0		7-28-82		
	47W464-243	0		7-7-82	04-11	
	0600200-04-11	3		7-7-82		
	47B464-608	0		9-2-82		
	609	0		7-7-82		
	612	0		7-7-82		
	611	0		7-7-82		
	610	0		7-7-82		
	604	0		7-7-82		
	605	0		7-7-82		
	606	0		7-7-82		
	607	0		7-7-82		
~~—~~	~~47W450-201~~	~~9~~	~~2-30-83~~		DELETE	N3-67-24A 19
~~—~~	~~221~~	~~6~~				
~~—~~	~~47B450-365~~	~~3~~				
~~—~~	~~366~~	~~3~~				
~~—~~	~~367~~	~~4~~				
~~—~~	~~368~~	~~4~~				
	0600200-13-12	01		7-7-82	13-12	
~~—~~	~~47W465-207~~	~~0~~			DELETE	19
	47B465-364	0		7-7-82		
	365	0				
	366	0				
	367	0		7-7-82		

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AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UNITS ON DRAWING REV.
1&2	47W437-201	9	8-30-82	6-23-82	N3-72-1A	
	~~0600200-[illegible]~~	~~902~~	~~2-31-83~~		DELETE	19
	13-02	902	X	8-10-82	VOIDED	
	13-07	902	2-30-83		DELETE VOIDED	19
	28-02	904		8-10-82		
	47W465-205	0			13-07	
	-206	0			13-02	
	47W427-219	0		8-10-82	05-02	
	0600200-05-02	901				
	47B427-500	0				
	-501	0				
	-502	0				
	-503	0				
2	~~0600200-13-12~~	~~901~~			DELETE 13-12	A
	47W465-207	0		8-3-82		
	~~47B465-364~~	~~0~~			DELETE	A
	~~365~~	~~0~~				A
	~~366~~	~~0~~				19
	~~367~~	~~0~~				19
1&2	47W465-203	0		9-2-82	13-06	
	0600200-13-06	902		9-2-82		
	47B465-368	0		9-2-82		
	-369	0		9-2-82		
	-370	0		9-7-82		
	~~371~~	0			DELETE	A
1	47W435-220	0	7-[illegible]-82	9-24-82	09-02	
~~1&2~~	~~47W206-200~~	~~2~~	2-30-83		DELETE N3-26-4A	
~~1&2~~	~~47W206-201~~	~~4~~			DELETE	
~~1&2~~	~~47W450-204~~	~~0~~	[illegible]-82		DELETE N3-67-21A	19
	~~47B450-[illegible]~~	~~4~~				19
	~~505~~	~~1~~				19
	~~506~~	~~1~~				19
	~~507~~	~~1~~				19
	~~508~~	~~1~~				19
1	47W450-200	7		8-3-82	N3-67-22A, 23A	
1&2	-203	8		8-3-82		

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AFFECTED UNIT	DRAWING OR S. M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
~~1 2~~	~~478550-567~~	~~0~~	~~7-6-82~~		~~DELETE~~ N3-67-22A, 23A	19
~~1~~	~~567~~	~~0~~				
~~1~~	~~495~~	~~1~~				
~~1~~	~~571~~	~~1~~				
~~1~~	~~497~~	~~2~~				
~~1~~	~~507~~	~~1~~				
~~1 2~~	~~560~~	~~1~~				
~~1~~	~~508~~	~~0~~				19
2	529	2	7-6-82	7-17-82	N3-67-10A	
2	0600250-07-02	401	7-10-82	7-17-82	07-02	
	47B464-398	1		7-29-82		
	402	2				
	401	1				
	396	1				
	399	1				
	403	1				
	400	1				
	397	1				
	449	1				
	451	1				
	452	1				
	47B464-450	1				
	47W464-222	5		7-29-82		
	~~47W464-244~~ NN 7-29-82	~~1~~		~~7-29-82~~ NN		
	~~37W206-201~~ NN 7-29-82	~~4~~		~~7-29-82~~ NN		
	~~37W206-200~~ NN 7-29-82	~~3~~		~~7-29-82~~ NN		
	47W450-244	0		7-29-82		

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			EXPECTED	ACTUAL		

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*FECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
~~2~~	~~47B427 - 353~~	~~3~~	~~[illegible]~~		DELETE	19
	~~356~~	~~2~~				
~~1&2~~	~~47W400 - 211~~	~~1~~				
~~2~~	~~47W435 - 221~~	~~0~~				
~~1~~	~~0600200 - 07-03~~	~~901~~				
~~1&2~~	~~47W450 - 223~~					
~~2~~	~~- 234~~					
~~1&2~~	~~47W400 - 208~~					
	~~47W427 - 218~~					
	~~47W427 - 504~~					
	~~47W427 - 505~~					
	~~47W427 - 506~~					
	~~47W427 - 507~~					
~~1~~	~~0600200 - 04-08~~	~~902~~				
~~1&2~~	~~47W465 - 208~~	~~1~~				
	~~47W465 - 209~~	~~0~~				
	~~47W464 - 240~~	~~5~~				
	~~0600200 - 06-01~~	~~902~~				
	~~0600200 - 13-03~~	~~902~~				19
2	47W464 - 241	1		7-29-82	250-04-04	
	~~0600250 09-02~~		~~10-30-82~~ 2-28-83		DELETE	19 ~~12~~
	47W450 - 219	5		9-9-82		12
	~~- 220~~				DELETE	19 ~~12~~
	201	9		8-3-82		12
	221	6		8-3-82		12
	233	2		9-9-82		12

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			EXPECTED	ACTUAL		

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AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	47B435 - 471	1	~~8-30-82~~		~~09-02~~ DELETE	19
	- 472	1				
	- 473	1				
	- 474	1				
	- 449	1				
	47B435 - 445	1				
	- 446	1				
	47B435 - 406	2				19
1&2	47W401 - 213	2	8-30-82	8-10-82	02-06	
	0600200-04-10	905		9-2-82		18
	47B427-517	0				
	518	0				
	519	0				
	520	0				
	47W491-212	1				
	47B491-424	0				
	47B406-385	4	~~8-30-82~~	9-8-82		
	-383	3				
	-392	3				
	-402				DELETE	19
	-404					19
	-405					19
	-406					19
	565	0		9-8-82		
	566	0				
	567	0				
	555	0		9-8-82		
	47W406-207	4				
	47B435-471	1				
	472	1				
	473	1				
	474	1				
	449	1				

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			EXPECTED	ACTUAL		

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1&2	47W450 - 450	4	[illegible]/30/82		DELETE N3-67-9A	19
	451	4				
	452	4				
	453	3				
	454	4				
	456	4				
	457	4				
	458	4				
	459	4				
	460	4				
	461	3				
	462	3				
	464	3				
	465	3				
	466	3				
	468	3				
	469	3				
	470	2				
	471	3				
	472	4				
	434	2				
	440	1				
	441	2				15
1&2	47[illegible]427 - 521	0	[illegible]/30/82	9-24-82	0600200-05-01	
	507	0		9-24-82		
	47[illegible]401 - 415	1		9-24-82		
	414	1		9-24-82		
1&2	47W401 - 216	0		9-24-82		
	47B450 - 444	3		9-23-82		
	47B450 - 445	4		9-23-82		
	47B450 - 449	4		9-23-82		
	450	4		9-23-82		
	451	4		9-23-82		
	452	4		9-23-82		
	453	3		9-23-82		
	454	4		9-23-82		

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AFFECTED UNIT	DRAWING OR B/M NUMBER	OWO REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPD ON DATA REV. NO.
	47B450-455	4		9-23-82		16
	456	4		9-23-82		
	457	4		9-23-82		
	458	4		9-23-82		11
	459	4		9-23-82		
	460	4		9-23-82		
	461	3		9-23-82		
	462	3		9-23-82		
	464	3		9-23-82		
	465	3		9-23-82		
	466	3		9-23-82		
	468	3		9-23-82		
	469	4		9-23-82		
	470	2		9-23-82		
	471	3		9-23-82		
	472	4		9-23-82		
	~~473~~	2		9-23-82		
	47W465-209	0	~~2-30-83~~ 1-30-82		DELETE	19 15
	47W450-226	3		11-22-82		13
	47W450-227	3		11-22-82		13
1&2	47W450-209	6	4-30-83	3-18-83	N3-67-9A	17
	-210	8				
	-211	6				
	-212	8				
	-213	9				
	-224	9				
	-214	7				
1	47W437-203	8			N3-72-1A	
1&2	47W491-203	7			N3-26-3A	
	-204	6				
	-205	6				
	-212	2				
	-206	6				
	47W450-215	5				
	47W450-231	5				

TVA 10575E (EN DES-7-79)

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DATA SHEET NO. 2

AFFECTED UNIT	DRAWING OR P&I NUMBER	DWG REV.	[illegible]	DATE [illegible]	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
~~1~~	~~47W406 - 200~~					
2	~~47W406 - 200~~			Delete	N3-62-3A	
	~~- 201~~				-3A	
	~~- 202~~				-3A	
	~~47W406 - 203~~				N3-62-1A	
	~~47W406 - 205~~				N3-62-2A, 15A, 26A	
	~~47W406 - 206~~				N3-62-11A, 16A, 22A	
	~~47W406 - 207~~			↓	N3-62-25A	
	47W427 - 205	6		7-21-13	N3-3-1A, 2A, 9A	
	~~47W427 - 208~~			Delete	N3-3-15A	
	~~47W427 - 209~~				N3-3-16A	
	~~- 210~~				-16A	
	~~47W427 - 211~~				N3-3-17A, 19A	
	~~47W427 - 213~~				N3-3-6A	
	~~47W427 - 214~~				N3-3-8A	
	~~47W427 - 216~~				N3-3-18A	
	~~- 217~~				-18A	
	~~47W432 - 200~~				N3-74-1A	
	~~- 201~~				-1A	
	~~- 202~~				-1A	
	~~- 203~~				-1A	
	~~47W435 - 206~~				N3-63-7A	
	~~207~~				-7A	
	~~208~~				-7A	
	~~209~~				-7A	
	~~47W435 - 212~~				N3-63-2A	
	~~47W435 - 214~~				N3-63-4A	
	~~215~~				-4A	
	~~47W437 - 200~~				N3-72-2A, 5A	
	~~47W437 - 201~~				N3-72-1A	
	~~- 202~~				-1A	
	~~203~~				-1A	
	~~47W450 - 202~~				N3-67-2A, 28A	
	~~47W450 - 203~~				N3-67-21A, 22A, 23A	
	~~47W450 - 205~~				N3-67-3A, 25A	
	~~47W450 - 206~~			↓	N3-67-26A, 27A	
▼	47W450 - 207	4	↓	12-22-15	N3-67-5A	

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DATA SHEET NO. 2

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AFFECTED UNIT	DRAWING OR S/M NUMBER	OWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UP WITH DATA REV. NO.
2	47W450 - 208	11	~~1-30-83~~	12-22-82	N3-67-6A	14
	~~47W450 - 216~~		~~3-30-83~~	Delete	N3-67-19A, 20A	31
	47W450 - 223	3		12-15-82	N3-67-10A	
	~~47W450 - 233~~		~~7-30-83~~	Delete	N3-67-15A	31
	~~47W450 - 234~~				N3-67-16A	31
	~~47W450 - 235~~				N3-67-17A	31
	~~47W450 - 236~~				N3-67-18A	31
	47W464 - 200	5		12-22-82	N3-70-1A	
	47W464 - 205	5			N3-70-6A	
	47W464 - 227	2			N3-70-38A, 39A	
	47W464 - 229	6			N3-70-36A, 37A	
	47W464 - 232	2		1-10-83	N3-70-34A	
	47W464 - 234	1			N3-70-35A	
	~~47W464 - 2387~~		~~7-30-83~~	Delete	N3-70-2R	31
	47W491 - 201	3		5-25-83	N3-26-2A	
	~~47W555 - 202~~			Delete	N3-62-10A	31
	47W555 - 206	7		9-20-83	N3-62-7A	
	~~47W555 - 208~~			Delete	N3-62-18A, 19A	31
	~~9600250 - 15-01~~			Delete	15-01	31
	~~- 15-02~~			Delete	15-02	31
1&2	~~47B450 - 483~~	3		Delete	~~N3-67-11A~~	28
	484	5		4-28-83		
	~~489~~	2		Delete		
	~~593~~	2				
	~~619~~	1				
1	47B427 - 440	1		11-22-82	N3-3-1A, 2A	
	441	2				
	434	2				
2	47B464 - 470	1	1-15-83	1-10-83		15
2	47B464 - 664	0	7-30-83			
2	47B464 - 472	1				
2	47B464 - 663	0				16
N2	47W492 - 200	3	3-30-83	1-14 3		
1&2	~~47W405 - 209~~		~~7-30-83~~	Delete	13-05	28

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DATA SHEET NO. 2

AFFECTED UNIT	DRAWING OR BOM NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	47W427-218	1	4-30-83	3-23-83	05-01	18
1	47W401-216	1		3-23-83	"	18
1	47W492-201	2		3-22-83	N3-81-1A	18
1&2	47W492-200	3	↓	3-23-83	N3-33-1A	18
2	47W491-211	2	5-30-83	4-29-83		20
1&2	47W450-232	0		4-28-83		20
1&2	47W401-219	0		↓		20
↓	47B450-622	1				20
↓	47W450-226	4	↓	↓		20
2	47B450-578	2	5-30-83	5-10-83	N3-67-6A	22
2	47B491-374	2	6-30-83	5-25-83	N3-26-2A	22
2	↓ 375	2	↓	↓	↓	↓
2	↓ 395	4	↓	↓	↓	↓
↓	47W450-251	0	6-30-83	6-8-83	N3-67-28A	23
↓	47B450-364	2	↓	↓	↓	↓
↓	↓ 363	2	↓	↓	↓	↓
↓	↓ 502	2	↓	↓	↓	↓
↓	↓ 503	4	↓	↓	↓	↓
↓	↓ 506	2	↓	↓	↓	↓
↓	↓ 508	2	↓	↓	↓	↓
↓	↓ 512	2	↓	↓	↓	↓
↓	↓ 589	1	↓	↓	↓	↓
1&2	47W450-217	6	↓	6-8-83	N3-67-1A	↓
	~~47B450-626~~	~~0~~	~~7-30-83~~	~~Delete~~	↓	~~28~~ 25
	~~↓ 625~~	~~0~~	↓	~~Delete~~	↓	~~21~~ 21
	~~↓ 587~~	~~1~~	↓	~~Delete~~	↓	~~28~~ 28
1&2	47B450-598	1	6-30-83	6-14-83	N3-67-2A	29
↓	↓ -597	1	↓	↓	↓	↓
1&2	47W450-250	0	↓	6-14-83		
1	0600200-04-07	04	7-31-83	7-12-83	04-07	25
1&2	47W465-221	0	↓	7-12-83	13-01	25
1&2	0600200-13-01	04	↓	↓	13-01 (VOID)	25
1	47W435-200	9	7-30-83	7-22-83	N3-63-1A	26
1&2	47W450-225	3	↓	7-27-83	N3-67-7A	26
2	47W427-205	6	↓	↓	N3-3-9A	26
2	~~42-53 Estimate~~		~~7-30-83~~ (see rev 04)	Delete		31 ~~27~~ 27

TVA 10870E (EN DES-7-79)

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ENGINEERING CHANGE NOTICE NO. 2576

DATA SHEET NO. 2

AFFECTED UNIT	DRAWING OR BOM NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UP ON DATA REV. NO.
1	47W401-208		2-26-80	DELETE	200-02-01	29
1	-210			DELETE	-03	30
1	-211			DELETE	-04	30
2	47W450-244			Delete	N3-67-21A	31
2	47W655-200				N3-62-28A	31
2	478450-508		3-10-80		N3-67-28A	31
2	478450-502					31
2	478450-506					31
2	478450-503					31

SCOPE OF CHANGE ESTIMATE

WATTS BAR NUCLEAR PLANT ECN NO. 2576

BUILDING AUXILIARY

SYSTEM/FEATURE: E.R.C.W.

☒ Revisions by this section will not require additional material

☐ Revisions by this section will require additional materials as listed below

Item	Unit 1 Qty	Unit 2 Qty	Procured By (EN DES/CONST)	PR, Reqn, or Contr	Requested Delivery Date	Remarks

Michael A. Bradley
Preparer

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2626
DATA SHEET NO. 3
Watts Bar Nuclear Plant, Spring City, Tn

BRANCH SWP
PAGE 1

To:

Attn: Design Project Manager SWP 201 C-K

JAN 1 1981

Released By: [signature] Design Project Manager

Preparing Section	WMG-1
Prepared By:	JB Thomas
Total Pages (RO):	2
Section Supervisor:	[signature]
Staff Eng. or Architect:	NA
Group Head:	[signature]
Branch Chief:	Date

	MEDS Accession No.		MEDS Accession No.
R0	SWP '81011 538	R4	WBP '830815 514
R1	SWP '81 1106 539	R5	WBP '840216 501
R2	SWP '82 0903 526	R6	WBP '840525 546
R3	SWP '82 1124 521	R7	

SCOPE

Project WATTS BAR NUCLEAR Affected Units 1 & 2

System or Feature VARIOUS

Reference & Description of Change

REUSE HANGER MARK-UP PHYSICAL DRAWINGS FOR DISCREPANCIES DISCOVERED DURING MARK-UP OF ANALYSIS ISOMETRICS

CD

DATE

CLOSURE SH.*

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PREPARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
1	12-3-81	JRW	[illegible]	[illegible]	N/A	PSM	[illegible]	ADDED DRAWING NUMBERS	2
2	9-3-82	TNS	[illegible]	[illegible]	N/A	CE	[illegible]	ADDED DRAWING NUMBERS	14
3	11-24-82	RMM	[illegible]	[illegible]	N/A	HH	[illegible]	ADDED DRAWING NUMBERS	16
4	2-15-83	CBR	[illegible]	[illegible]	/	MJC	[illegible]	ADDED 26 EST'M U2 DRAWINGS	16
5	2-16-84	[illegible]	[illegible]	[illegible]	[illegible]	MK	[illegible]	Revised to indicate that 4 dwgs weren't issued against this ECN	16
6	5-0-84	MK	[illegible]	[illegible]	[illegible]	MK	[illegible]	Delete unit 2 Dwgs. See unit 2 ECN 4857	16

c. N/A
Materials as follows: NONE

Additional Information:

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 10679A (EN DES-6-79)

TENNESSEE VALLEY AUTHORITY
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ENGINEERING CHANGE NOTICE NO. 2526
DATA SHEET NO. 3

PAGE 2

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE U ON DA REV
~~1 & 2~~	~~47W555-4~~	~~2~~	~~10-30-81~~	~~10-30-81~~		1
1 and 2	47W555-4	2	10-30-81	10-30-81		1
	12	14				1
	18	16				1
1	1-62A-490	3	11/17/81	11/17/81	08-18	2
	460	4	12/16/81	12-16-81	08-17	
	463	3			08-17	
	311	3			08-10	
	~~317~~				~~08-10~~ DELETE TVA 12/1/81	
	038	1	12/16/81	12/16/81	08-02	
	047	3				
	048	3				
	050	2				
	052	1				
	063	2				
	066	3				
	067	3				
	613	2			08-05 13 TVA 12/1/81	
	875	1			08-05 13 TVA 12/1/81	
	876	1			08-05 13 TVA 12/1/81	
2	2-62A-298	3			08-10	
2	307	2			08-10	
2	311	4			08-10	
2	317	3			08-10	
1	1-62A-186	4	12/16/81	12/16/81	08-07	
1	170	1	12/16/81	12/16/81	08-07	
~~2~~	~~2-68-005~~				~~13-01~~ DELETE TVA 12/1/81	
1	1-63-230	A	12/17/81	12/17/81	09-07	
	232	1	12/19/81	12/19/81	09-07	
1	1-62A-711	5	1/16/82	1/16/82	08-06	
1	47W465-1	17	2/23/82	2/23/82	13-11	
	1-62A-13	1	12/22/81	12/22/81	8-01	
1	14	1	1		08-01	
1	15	1			08-01	
1	16	1			08-01	

TVA 10878E (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2576

DATA SHEET NO. 3

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	1-62A-17	1	12/22/81	12/22/81	08-01	2
1	18	3	↓	↓	08-01	
1	20	2	↓	↓	08-01	
1	23	1	↓	↓	08-01	
1	1-62A-071	5	12/16/81	12/16/81	08-03	
1	1-63-283	4	12/17/81	12/17/81	09-10	
1	290	4	↓	↓	09-10	
1	297	2	↓	↓	09-10	
~~1~~	~~1-62A-176~~	~~4~~	~~12/16/81~~	~~12/16/81~~	delete TVA 12/17/81	
2	62-2LCV-R41	2	12/17/81	12/17/81	555-208	
1	1-63-102	4	2/5/82	2/5/82	09-04 (1-63-102 DWG REVISED FOR TECH 2576 AS PART WAS ISSUED AS R404 ON 1-23-82 FOR ECN 87 PER FCR B-5725)	5
	127	2	↓	↓	09-04	
	128	2	↓	↓	09-04	
	131	3	↓	↓	09-04	
~~1~~	~~1-63-250~~				~~09-08~~ DELETE TVA 4/7/82	
	257	303	6/17/82	6/17/82	09-08	
1	1-62-A-277	5	1/16/82	1/16/82	47W406-320	
1	1-62A-536	1	↓	↓	↓	
2	2-62A-258	1	↓	↓	↓	
2	2-62A-277	1	↓	↓	↓	
1	1-62A-402	1	1/20/82	1/20/82	08-15	
1	47A060-63-7	2	2/8/82	2/8/82	435-202	
1	47W555-15	9	1/22/82	1/22/82	555-203	
1	62-1LCV-R201	1	1/22/82	1/22/82	555-203	
1	62-1CVC-R80	3	1/22/82	1/22/82	406-201	
1	62-1CVC-R113	1	1/22/82	1/22/82	406-201	
1	1-74-006	1	1/27/82	1/27/82	03-01	
1	1-63-392	3	1/26/82	1/26/82	09-03	
	393	3	↓	↓	↓	
	394	1	↓	↓	↓	
	397	3	↓	↓	↓	
	399	2	↓	↓	↓	
	400	1	↓	↓	↓	
	401	1	↓	↓	↓	
	402	1	↓	↓	↓	
	403	1	↓	↓	↓	

TVA 10873E (EN-DES-7-79)

ENGINEERING CHANGE NOTICE NO. 2576

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 3

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AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATE ON DATA SHEET REV. NO.
1	1-63-404	3	1/26/82	1/26/82	09-03	2
	406	2				
	407	2				
	408	4				
	409	2				
	410	1				
	411	3				
	412	1				
	413	1				
	414	2				
	415	3				
	~~316~~	3				
	317	1				
	318	6				
	319	4	↓	↓		
	320	2	1/26/82	1/26/82	↓	
1	1-87-55	1	2/4/82	2/4/82	15-02	
	57	4				
	58	4				
	72	5	↓	↓	↓	
1	47W435-8	20	8/16/82	8/16/82	435-216	
1	47W435-9	20	8/16/82	8/16/82	"	
~~1~~	~~62-1GV-8177~~				~~555-212~~ TVD 1/27/82	
~~1~~	~~62-1GV-8168~~				~~555-213~~ TVD	
~~1~~	~~62-1GV-8155~~				~~555-213~~ TVD ↓	
1	1-87-004	901	2/5/82	2/5/82	15-01	
1	72-1CS-V1A	905	2/18/82	2/18/82	437-200	
1	1-63-368	902	6/18/82	6/18/82	09-11	
↓	380	902	5/26/82	5/26/82	↓	
	343	905	6/18/82	6/18/82		
	583	901	6/18/82	6/18/82		
↓	599	905	5/26/82	5/26/82	↓	
1	47W555-6	16	2/6/82	2/6/82	555-210	
1	47W462-14	15	2/11/82	2/11/82	462-100	
1	47A462-8-5	2	↓	↓	↓	
1	-11	4	↓	↓	↓	↓

TVA 10575E (EN DES-7-79)

ENGINEERING CHANGE NOTICE NO. 2376

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 3

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AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	47A462-8-13	8	2-11-82	2/11/82	462-100	2
	47A435-1-8	1	5/24/82	5/24/82	435-200	
	~~63-1515-R42~~				DELETE [illegible]	
	63-1515-V36	902	5/24/82	5/24/82		
	63-1515-R32	901	3/15/82	3/15/82		
1	1-63-151	902	6/18/82	6/18/82	09-05	
	152	903	6/18/82	6/18/82		
	~~165~~				DELETE [illegible]	
	181	902	5/10/82	5/10/82		
	184	902	5/20/82	5/20/82		
1	1-63-132	1	2/5/82	2/5/82	09-04	
1	72-1CS-R84	902	3/8/82	3/8/82	437-203	
1	72-1CS-R104	902	3/8/82	3/8/82	437-203	
1	1-63-~~311~~ [illegible]				09-09	
	328	902	5/10/82	5/10/82	1-63-328 NEVER ISSUED FOR [illegible] SEE SHT 2 OF ECN 2065 DATA SHT (FOR 5-25-82 ISSUANCE AS R1)	5
	~~315~~ [illegible]					
	313	902	5/28/82	5/28/82		
	323	901	5/28/82	5/28/82		
	~~47A435-6-32~~ [illegible]					
	~~31~~ [illegible]					
	~~30~~ [illegible]					
1	62-1CVC-V187	904	4-2-82	4-2-82	406-206	
	R189	903				
	R190	902				
	R197	902				
	V199	905				
	R207	901				
	R266	901				
	R218	901				
	R219	903				
	~~R220~~				DELETE [illegible]	
	~~R221~~				DELETE [illegible]	
	R222	902				
1	47A060-62-20	2	5-4-82	5-4-82		
2	47A060-62-47	3	5-4-82	5-4-82	"	

0643

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 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 memorandum 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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AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATE ON DATA SHEET REV. NO.
1	1-87-102	303	2/24/82	2/24/82	15-04	2
	103	304				
	107	302				
	108	303				
	109	304				
1	1-87-84	304	3/2/82	3/2/82	435-251	
	88	302				
	89	302				
2	2-87-80	302				
	84	302				
	85	302				
	88	301				
	89	301				
1	62-1CVC-R15	307	4-27-82	4-27-82	406-203	
	R10	304				
	R11	305				
	R6	306				
2	62-2CVC-R15	302	~~4-27-82~~ 4/8/82			5
	R10				" "	
	R11	301	4-27-82	4-27-82		
	R7	301	"	"		
1	47A437-4-4	3	3/8/82	3/8/82	432-206	
	-6	4	3/6/82	3/6/82		
1	47A060-74-5	2	3/6/82	3/6/82		
2	74-2RHR-V162	301	3/6/82	3/6/82		
2	74-2RHR-R163	301	3/6/82	3/6/82		
~~1~~	~~62-1CVC-R18~~				~~406-200~~ DELETE TJ 4/20/82	
~~2~~	~~62-2CVC-R67~~					
~~2~~	~~R69~~					
~~6~~	~~47A060-62-35~~					
1	74-1RHR-R95	301	3/5/82	3/4/82	432-201	
~~1~~	~~74-1RHR-R232~~	TJ 4/20/82			432-203	
	47W437-2	20	3/5/82	3/5/82	437-202	
1	~~63-1515-V143~~	TJ 3/10/82			435-206	
	~~63-1515-R157~~				DELETE 4/11/82	
	~~63-1515-R163~~				" "	

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AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	~~69-1515-R211~~				~~435-208~~	2
	~~R285~~				"	
	~~69-1515-R251~~				~~435-209~~	
	~~R252~~				DELETE THIS 4/1/82	
	~~R276~~ Dr'l hole					
	~~R281~~					
	~~R283~~					
1	72-1CS-R137	302	3/8/82	3/8/82	457-203	
~~2~~	~~69-2515-157~~				~~435-206~~	
~~1~~	~~69-1515-R231~~				~~435-208~~ DELETE THIS 4/1/82	
~~1~~	~~69-1515-R232~~				"	
1	1-62A-320	302	8/5/82	8/5/82	406-321	
	339	301	8/5/82	8/5/82		
	343	301	8/30/82	~~8/31/82~~ 9-15-82		
	347	303	8/5/82	8/5/82		
	352	303	8/5/82	8/5/82		
	354	301	8/30/82	8-27-82	9-15-82	
	359	303	8/31/82	~~8/31/82~~ 9-15-82		
	362	304	8/5/82	8/5/82		
	~~366~~ To be deleted					
	368	303	8/5/82	8/5/82		
	381	305	8/5/82	8/5/82		
	385	302	8/5/82	8/5/82		
	386	302	8/5/82	8/5/82		
	388	301	↓	↓		
	559	303	↓	↓		
	560	302	8/5/82	8/5/82		
2	2-62A-320 SH 1,2	901	2/28/83	9-29-82		
	339 SH 1,2	901	↓	9-29-82		
	347 SH 1,2	902	↓	9-29-82		
	352	301	8/5/82	8/5/82		
	354 SH 1,2	901	2/28/83	9-29-82		
	360 SH 1,2	903	↓	9-29-82		
	363 SH 1,2	902	↓	9-29-82		
	367 SH 1,2	902	↓	9-29-82		
	368 SH 1,2,3	903	↓	9-29-82	↓	

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DATA SHEET NO. 2

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AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATE ON DATA SHEET REV. NO.
2	2-62A-381	901	8/3/82	8/3/82	406-321	2
	386 SH 1,2,3	902	2/28/83	9-29-82		
	388 SH 1,2	901		9-29-82		
	559 SH 1,2	901		9-29-82		
	560 SH 1,2	901		9-29-82		
	963 SH 1,2,3	901		9-29-82		
1	1-47B-1RHR-R175	904	6/30/82	6/30/82	432-202	
	R180	903	6/30/82	6/30/82		
	R181	902	6/30/82	6/30/82		
1	1-68-166 TM3 5/14/82				13-04 DELETE TM3	
	~~170 TM3 5/13/82~~				13-04 DELETE TM3	
1	63-1515-R53	902	5/10/82	5/10/82	435-203	
	V54	902	6/16/82	6/16/82		
	R55	902	5/10/82	5/10/82		
	V56	901	5/10/82	5/10/82		
	R57	902	6/16/82	6/16/82		
	R66	901	7/20/82	7/28/82		
	R83	901	5/10/82	5/10/82		
	R95	901	6/18/82	6/18/82		
	R96	903	7/29/82	7/28/82		
	R98	901	5/10/82	5/10/82		
1	~~62-1GVC-R241~~				406-207 62-1CVC-R247 NEVER ISSUED PER ECN 2576. SEE SHT 2 OF ECN 3939 DATA SET FOR 8-24-82 ISSUANCE AS R98	5
	R247	901	8/3/82	8/3/82		
	243	903				
	244	902				
	243	902	7/6/82	7/6/82		
	254	902	8/3/82	8/3/82		
	256	902	8/3/82	8/3/82		
	~~248~~				DELETE TM3 6/11/82	
	~~249~~		9-28-84			
2	~~62-1GVC-R246~~		~~4/30/83~~	Delete		6
	~~247~~					6
	~~243~~					6
	~~253~~					6
	~~244~~					6
	~~254~~					6

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AFFECTED UNIT	DRAWING OR BOM NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
2	~~62-2CVC-R56~~		~~7/28/82~~	Delete	406-207	6
2	47A060-62-97	2	5-4-82	5-4-82	406-314	
+	~~1-68-384~~				~~13-03~~	
+	~~1-68-386~~				~~13-03~~	
1	62-1CVC-R155	303	7/28/82	7/28/82	406-205	5
	R156	301	7/28/82	7/28/82		
	R157	301	7/28/82	7/28/82		
	~~R158~~					
	~~R159~~					
	~~R160~~					
	~~R161~~					
2	~~62-2CVC-R155~~		~~7/28/82~~	Delete		6
	~~R156~~					6
	~~R157~~					6
	~~R158~~					6
	~~R159~~					6
	~~R160~~					6
	~~R161~~					6
1	1-68-409	303	5/25/82	5/25/82	13-03	
1	1-68-411	302	5/25/82	5/25/82	13-03	
2	62-2CVC-R211	302	4-2-82	4-2-82	406-206	
	R213	302				
	R214	301				
	R215	301				
	R216	302				
	R217	301				
	R219	303				
	R220	301				
	R221	303				
	R222	301				
	V223	304				
	R224	301				
	R257	301				
	R258	301				
	R259	301				
	R260	301				

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AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
2	62-2CVC-R261	901	4-2-82	4-2-82	406-206	2
	R262	902				
	R263	901				
	R264	901				
	R265	901				
	R266	901				
	R267	901				
	R268	901				
	R269	901				
	R270	901				
	R271	902				
	R272	901				
	R273	901				
	R274	901				
	R275	901				
	R276	902				
	R277	902				
1	~~1-63-398~~				03-05 TVA 8/11/82	
	393	903	7/6/82	7/6/82		
	394	902	7/28/82	7/28/82		
	~~397~~					
	~~418~~					
1	1-62A-52	902	5/7/82	5/7/82	08-02	
1	1-63-86	904	8/5/82	8/5/82	09-02	
	~~84~~				DELETE TVA 8/19/82	
	~~88~~					
	~~89~~					
	~~90~~					
	38	903	8/5/82	8/5/82		
	~~65~~				TVA 8/19/82	
	73	904	8/5/82	8/5/82		
	70	907				
	55	903				
	~~84~~				TVA 8/19/82	
	~~80~~					
	81	902	8/5/82	8/5/82		

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AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	1-63-75	302	8/3/82	8/3/82	03-02	2
	47A435-3-27	2				
	26	2				
	24	2				
	23	2				
	21	3				
	~~30~~				} Twr 8/3/82	
	~~42~~					
	41	2	8/3/82	8/3/82		
	33	4				
	31	3				
	32	4				
	~~29~~				Twr 8/13/82	
	9	3	8/3/82	8/3/82		
	~~8~~				} Twr 8/13/82	
	~~20~~					
	47A435-8-29	3	8/3/82	8/3/82		
	7	3				
	27	1				
1	1-68-333	303	7/7/82	7/7/82	13-09	
	334	301				
	335	301				
	337	302				
	339	303				
	340	303				
	341	304				
2	2-68-333	301				
	~~334~~	301				
	335	301				
	337	301				
	339	301				
	340	301				
	341	302				
1	62-1CVC-R252	303	8/3/82	8/3/82	47W406-207	
	R250	304	8/3/82	8/3/82	"	
1	1-68-167	303	4/15/82	6/18/82	13-04	

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DATA SHEET NO. 3

AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATE ON DATA SHEET REV. NO.
1	47A465-5-1	1	7/7/82	7/7/82	13-09	2
2	47A965-5-3	1	7/7/82	7/7/82	13-09	
1	1-62A-800	303	8/6/82	8/6/82	08-12	
	802	304	8/6/82	8/6/82		
	~~803~~				not similar	
	805	301	8/6/82	8/6/82		
	817	302				
	822	304				
	823	303				
	824	305				
	825	302				
	826	305				
	828	301				
	829	301				
	831	301				
	832	302				
	835	304				
	47A406-9-19	0				
	19A	0				
2	2-62A-584	301				
	800	301				
	802	301				
	803	301				
	817	301				
	823	302				
	828	301				
	829	302				
	831	301				
	832	301				
	47A406-14-43	0	2/28/83	6/20/83	9-1582	
	14-43A	0				
	14-44	0				
	14-44A	0				
	13-55	0				
	13 55A	0				

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ENGINEERING CHANGE NOTICE NO. 2576

DATA SHEET NO. 3

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
2	47A406-13-56	0	~~8/28/83~~	~~8/30/82~~	~~CCM~~ 4-15-82	2
	13-56A	0				
	13-57	0				
	13-57A	0				
1	1-62A-108	~~303~~	8/3/82	8/3/82	406-316	
1	47A060-62-14	302	~~8/3/82~~ ~~7/28/82~~	8/3/82	406-205	
2	~~41~~		~~8/28/83~~	Delete		6 3
1	15	~~304~~	8/3/82	8/3/82		
2	~~42~~		~~8/28/83~~ ~~7/28/82~~	Delete		6 3
2	~~46~~		~~8/28/83~~ ~~7/28/82~~	Delete		6 3
1	24	302	8/3/82	8/3/82		
2	~~51~~		~~8/28/83~~ ~~7/28/82~~	Delete		6 3
1	17	302	8/3/82	8/3/82		
2	~~44~~		~~8/28/83~~ ~~7/28/82~~	Delete		6 3
1	62-1CVC-V148	303	8/3/82	8/3/82		
	R153	303				
	R172	302				
	V174	302				
	V181	302				
2	~~62-2CVC-R173~~		~~8/28/83~~ ~~7/28/82~~	Delete		6 3
	~~V174~~					6 3
	~~V177~~					6 3
	~~V181~~					6 3
	~~R182~~					6 3
1	74-1RHR-R232	305	6/30/82	6/30/82	432-202	
1	1-63-392	304	7/6/82	7/6/82	09-03	
	47W435-1	14	8/16/82	8/16/82	435-205	
	4	13	8/16/82	8/16/82	435-205	
1	1-63-400	302	7/28/82	7/28/82	09-03	
	401	302				
	402	302				
	403	302				
1	~~1-68-231~~ TVA 8/31/82		8/31/82	—	13-06	
	232	301		8/31/82		
	~~234~~				TVA 8/31/82	
	235	301		8/31/82		

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AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATE ON DATA SHEET REV. NO.
1	1-68-239	301	8/31/82	~~8/31/82~~ 9-15-82	13-06	2
	~~241~~				TVA 8/31/82	
	243	302		~~8/31/82~~ 9-15-82		
	245	301		~~8/31/82~~ ↓		
	252	303		~~8/31/82~~ 9-15-82		
	~~266~~				TVA 8/31/82	
	~~238~~					
	~~253~~					
	~~239~~				TVA 8/31/82	
	237	303		~~8/31/82~~ 9-15-82		
	233	302		~~8/31/82~~ ↓		
	~~238~~ TVA					
	240	302	↓	~~8/31/82~~ 9-15-82		
2	~~2-68-231~~		~~8/31/82~~ 9/28/82		TVA 8/31/82	
	232	301		9/14/82		
	~~234~~				TVA 8/31/82	
	235	301		9/14/82		
	239	301		~~9/14/82~~ 9/14/82		
	~~241~~				TVA 8/31/82	
	243	302		9/14/82		
	245	301		9/14/82		
	252	901	2/28/83	10-12-82		
	~~266~~		~~4/28/83~~		TVA 8/31/82	
	238	301		9/14/82		
	253	302		9/14/82		
	237	301		↓		
	233	301		↓		
	~~238~~ TVA				TVA 8/31/82	
	240	301	↓	9/14/82	↓	
1	47A060-62-21	303	8/3/82	8/3/82	406-205	
↓	1-63-390	302	↓	↓	03-03	
	412	302	↓	↓	03-03	
↓	097	901	8/5/82	8/5/82	03-02	
1	1-68-257	306	8/31/82	~~8/31/82~~ 9-10-82	13-06	

TVA 1 ·73E .cN DES-7-79)

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AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	1-63-072	301	8/3/82	8/3/82	03-02	2
	-068	308				
	-100	301				
1	47A435-9-9C	3				
	-27B	1				
	-33A	2				
	41	2				
1	47A435-8-74	1	8/3/82	8/3/82	03-02	
1	1-62A-584	303	8/6/82	8/6/82	08-12	
1	47A060-62-14A	302	8/3/82	8/3/82	406-205	
1	1-63-071	305			03-02	
	492	303				
	47A435-8-76	0				
	76A	0				
1	1-68-261	303	8/31/82	8/31/82 9/15/82	13-06	
2	2-68-261	301	2/28/83	9/1/82	13-06	
1	1-68-238	301	8/31/82	8/31/82		
~~2~~	~~2-68-238~~				~~Tr's 8/31/82~~	
~~1~~	~~1-68-239~~	~~301~~	~~8/31/82~~	~~8/31/82~~	~~Tr's 8/31/82~~	
~~2~~	~~2-68-239~~					
1	1-68-242	301	8/31/82	9/1/82		
2	2-68-242	301	8/31/82	8/31/82		
2	2-68-231	902	12/30/82	1-4-83		3
	-232	902				
	-233	902				
	-235	902				
	-236	902				
	-237	902				
	-238	902				
	-239	902				
	-240	902				
	-241	903				
	-242	902				
	-243	903				
	-245	902				
	-246	902				

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AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATE ON DATA SHEET REV. NO.
2	2-68-250	902	12/30/82	1-4-83		3
	-251	903		1-4-83		
	~~-252~~			Delete		6
	-253	903		1-4-83		
	-255	902				
	-259	902				
	-261	902				
	-263	902				
	-264	902		↓		
	47A465-5-5	2		1-4-83		
	2-62A-258	902		1-4-83		
	-277	902		↓		
	-298	904		1-20-83		
	-307	903		1-4-83		
	~~-311~~		~~9-28-84~~	Delete		6
	~~317~~		~~9-28-84~~	↓		6 B
	-352	902		1-4-83		
	-381	902				
	-584	902				
	-800	902				
	-802	902				
	-803	902				
	-817	902				
	-823	903				
	-828	902				
	-829	903				
	-851	902	↓	↓		
~~2~~	~~26 ESTIM DRAWINGS~~			Delete		6 F

TENNESSEE VALLEY AUTHORITY
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ENGINEERING CHANGE NOTICE NO. 2526
DATA SHEET NO. 4

BRANCH SWP
PAGE 1

To: Watts Bar Nuclear Plant, Spring City, TN

Design Project Manager

Released By: Design Project Manager

APR 13 1981

Originating Section	SWP WMG #3
Prepared By:	John A. Lund
Total Pages (RO):	
Section Supervisor:	R.S. Pratt
Staff Eng. or Architect:	
Group Head:	
Branch Chief: Date	

	MEDS Accession No.		MEDS Accession No.
RO	SWP 810113 539	R4	WBP 830705 503
R1	SWP 821109 556	R5	WBP 830815 503
R2	WBP 830606 500	R6	WBP 840525 547
R3	[illegible] 514	R7	

SCOPE

Project WATTS BAR NUCLEAR PLANT Affected Units 1 and 2

System or Feature VARIOUS PIPING SYSTEMS

Reference & Description of Change ADDITIONS OF PIPE SUPPORT NUMBERS AND ANCHOR NUMBERS TO THE PHYSICAL PIPING DRAWINGS.

DATE

CLOSURE SH. #

~~AFFECTED DWGS WILL BE LISTED LATER~~

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PREPARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
1	11-9-82	RSP	RSP	[illegible]	N/A	CE	JCS	Added drawings	6
2	6-6-83	JFL	RSP	JKH	N/A	MK	JCS	Added pages 7 through 14, updated 07	14
3	6-14-83	JFL	RSP	JKH		MK	JCS	Deleted 47A450-2 [illegible]	14
4	7-5-83	TGD	RSP	JKH		MK	JCS	Added 1-70-159 (Pg 6), Deleted 67-[illegible]	14
								Deleted 67-1 [illegible]	
5	8-15-83	RSP	RSP	JKH		MK	JCS	Added unit 2 estimate on sh. 14	14
6	5-4-84	MK	RSP	JKH		MK	JCS	Delete unit 2 estimate, See unit 2 ECN 4857	14

No.

Materials as follows:

Additional Information:

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, W8C126 C-K
Chief, Electrical Engineering & Design Branch, W2D224 C-K
Chief, Mechanical Engineering & Design Branch, 102SPT-K
MEDS, E4B37 C-K

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0655

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AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UP ON DATA REV.
1&2	47W450-23	10	3-1-81	2-19-81		
2	47A450-2-109	1	6-15-81	6-6-81		
1&2	47W560-18	12		12-10-81		
1	47A454-2-41	3		12-10-81	No CONST work	
1&2	47W464-20	10		12-14-81		
1&2	" -5	12		12-16-81		
1&2	47W454-2	22		12-18-81		
1&2	" -4	20		12-18-81		
"	" -1	21		12-28-81		
1	1-70-001	2			No CONST work	
"	" -012	1			" " "	
"	" -030	2			" " "	
"	" -041	3			" " "	
"	" -045	1			" " "	
"	" -046	4			" " "	
"	47A454-2-25	4		1/14/82	" " "	
"	1-70-285	2			" " "	
"	70-1CC-V195	6			" " "	
"	" -R196	2			" " "	
"	" -V198	6			" " "	
"	" -R199	5			" " "	
"	" -V200	3			" " "	
"	" -R203	2			" " "	
"	" -R205	3			" " "	
"	" -R208	4			" " "	
1&2	47W464-7	16		1/25/82		
"	" -11	12				
"	47W450-3	25		2/1/82		
"	47W492-4	7		2/16/82		
~~1~~	67-1ERCW-R303	901		4/5/82	Const work - ISSUED ON 2756 SUPPLEMENT 5-24-82	
1	72-1CS-R77	902		5/24/82	No Const work	
2	47A450-8-16	3		7/1/82	No Const work	
2	67-1ERCW-R512	907		7/6/82	" " "	
1&2	47W450-21	16		7/2/82		
1&2	47W450-24	16				
2	" -25	11				

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AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
2	47W450-28	0		7/2/82		
1&2	-3	26		7/7/82		
	-6	16				
	-7	15				
	-8	14				
	-9	17				
	-10	15				
	-14	15				
	-19	19				
	-20	13				
2	67-1ERCW-R575	902		7/15/82	No CONST work	
2	-R577	903				
1	47A450-20-3	1			No CONST work	
1	-2	1				
1	-1	1				
	47A454-3-16	2		7/19/82	No CONST work	
	-23	3				
	-40	1				
	-73	1				
	-12	2				
	-14	2				
	~~-16~~	~~2~~			RSP 7/17/82	
	47A454-2-29	4				
	-31	4				
1	2-1AAB-R039	903		7/22/82	No CONST work	
1	-R042	905				
1	-R043	905				
1	-R049	902				
1	-R050	904				
1	-R067	905				
1	67-1ERCW-R150	901				
1	-R163	906				
1	-R164	905				
1	-R260	902				
1	-R261	902				
1	-R263	905				

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AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPON ON DRT/ REV. N
1	67-1ERCW-R264	904		7/22/82	No CONST work	
2	" -R552	904		"	"	
1	47A060-67-15	4		"		
2	47A450-3-172	1		"	"	
~~2~~	" -B-10	3			Rep 7/22/82	
~~2~~	" -B-12	4			Rep 7/22/82	
2	12-1AAB-R041	905		7/23/82	No CONST WORK	
1	67-1ERCW-R259	902			CONST WORK	
1	" -R265	901		"	"	
1	47A431-10-1	2		7/26/82	No CONST WORK	
1	-5	2			CONST WORK	
2	-8	3				
1	-31	2				
1	-32	1				
2	47A450-3-115	2			No CONST WORK	
2	67-1ERCW-R542	904				
2	47A450-3-41	2		8/16/82		
1	47A454-3-B6	3				
1	67-1ERCW-R213	901				
1	" -R216	901				
1	" -R222	902				
1	" -R223	904				
1	" -R225	901				
2	" -R525	902				
2	" -R530	902				
2	" -R532	902				
2	" -R534	903				
1	" -R135	904				
~~2~~	" -R366	901			Rep 8/16/82	
1	67-1ERCW-R300	904		8/14/82	No CONST Work	
Rep on Unit 1	67-1ERCW-R296	901		"		
1	67-1ERC -R364	903		8/30/82		
1	" -R387	907				
1	" -R388	904				
1	" -R395	905				
1	" -R466	902				

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AFFECTED UNIT	DRAWING OR BOM NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	67-1ERCW-R407	904		8/30/82	No CONST Work	1
	-R408	902				
	-R409	904				
	-R410	903				
	-R411	903				
	47A450-4-46	3		9/1/82		
	67-1ERCW-R160	901				
	" -R191	906				
	47A431-10-10	2				
2	47A450-3-50A+50B	2				
2	47A450-4-26	1		9/3/82		
1	-34	1				
2	47A060-67-16	5				
1	67-1ERCW-R119	903				
	-R239	906				
	-R245	903				
	-R256	905				
	-R257	902				
	-R258	904				
	-R422	905				
	-R445	902				
	-R447	902				
	-V457	905				
	-R468	905				
	-R471	903				
	-R476	901				
	-R479	904				
	-R496	903				
	-R498	905				
	-R574	901				
	-R582	902				
	47A431-10-17	4				
	67-1ERCW-R89	901		9/9/82		
	47A450-3-110	4		9/10/82		
	-110A	0				2
	-76	2		9/13/82		

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1	47A450-3-114	2		9/13/82	CONST work	
1	12-1AAB-R005	904		9/15/82	No CONST work	
1	70-1CC-R369	904		9/23/82	CONST work	
1	" -R423	905		9/24/82	No CONST work	
1	1-70-328	901		9/27/82	CONST work	
1	47W454-2	24		10/4/82		
1	1-70-322	902			No CONST Work	
1	67-1ERCW-R335	902			↓	
1	70-1CC-R090	905			CONST Work	
1	" -V235	905			↓	
1	" -R238	905			CONST Work	
1	" -R259	903			↓	
1	" -R416	901			CONST Work	
1	47A464-2-161	0			CONST Work	
1	" -208	1			CONST Work	
1	" -236	2			↓	
1	~~47A464~~-9-001	2		↓	↓	
1	70-1CC-R248	904		10/8/82	No CONST work	
~~1~~	~~47A450-3-66~~	2		↓	↓ listed on 94 B	
~~1~~	~~47A464-10-11~~	4		↓	↓ listed on 94 B	
~~2~~	~~47A450-2-80~~	1		~~10/12/82~~	↓ listed on 94 B	
~~1~~	~~67-1ERCW-R336~~	~~903~~		~~10/22/82~~	~~CONST work~~ listed on 94 B	
~~1~~	~~70-1CC-R341~~	~~906~~		↓	↓ listed on 94 B	
~~1~~	~~47A464-2-9~~	~~2~~		↓	~~No CONST work~~ listed on 94 B	
~~2~~	~~47A450-3-74~~	~~2~~		~~10/20/82~~	↓ listed on 94 B	
1	47A450-8-12	4		7-26-83	CONST Work	2
1	67-1ERCW-R299	901		4-6-82		2
1	1-70-159	904	7-8-83	7-5-83		4

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AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
	67-1ERCW-V457 SH 3	905		9-7-82		
	67-1ERCW-R468 SH 1	905		9-7-82		
	67-1ERCW-R471 SH 1	903		9-7-82		
	67-1ERCW-R471 SH 2	903		9-7-82		
	67-1ERCW-R476 SH 1	901		9-7-82		
	67-1ERCW-R476 SH 2	901		9-7-82		
	67-1ERCW-R479 SH 1	904		9-7-82		
	67-1ERCW-R496 SH 1	903		9-7-82		
	67-1ERCW-R496 SH 2	903		9-7-82		
	67-1ERCW-R498 SH 1	905		9-7-82		
	67-1ERCW-R498 SH 2	905		9-7-82		
	67-1ERCW-R582 SH 1	902		9-7-82		
	67-1ERCW-R574 SH 1	901		9-7-82		
	47A450-2-89	4		9-8-82		
	3-94	2		9-8-82		
	3-96	2		9-8-82		
	4-28	4		9-8-82		
	47A450-4-28A	4		9-8-82		
	67-1ERCW-R334	901		9-8-82		
	67-1ERCW-R405 SH 1	907		9-8-82		
	R405 SH 2	907				
	R451 SH 1	906				
	R451 SH 2	906				
	R558 SH 1	902				
	R558 SH 2	902				
	R560 SH 1	901				
	R563 SH 1	902				
	R563 SH 2	902				
	R591 SH 1	902				
	67-1ERCW-R591 SH 2	902		9-8-82		
	67-1ERCW-R89	901		9-9-82		
	47A450-3-110	4		9-10-82		
	47A450-3-110A	0		9-10-82		
	~~47A450-3-179~~	0		~~9-13-82~~	ISSUED FOR RCN 2556 TELECON 9-24-82	
	47A450-3-76	2		9-17-82		
	47A450-3-114	2		9-17-82		

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AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UP ON DAT. REV. N
	12-1AAB-R005 SH 1	904		9-20-82		
	47A431-10-17	4		9-20-82		
	70-1CCR369	904		9-22-82		
	~~70-1CCR~~					
	70-1CC-R423 SH 1	905		9-27-82		
	70-1CC-R423 SH 2	905		9-27-82		
	1-70-322 SH 1	902		10-5-82		
	~~67-1ERCW-R422 SH 1~~	~~904~~		~~10-5-82~~		
	~~R436 SH 1~~	~~903~~		~~10-5-82~~		
	70-1CC-R90 SH 1	905		10-5-82		
	SH 2					
	SH 3					
	SH 4					
	70-1CC-R90 SH 5	905				
	70-1CC-V235 SH 1	905				
	SH 2					
	SH 3					
	70-1CC-V235 SH 4	905				
	70-1CC-R238 SH 1	905				
	70-1CC-R238 SH 2	905				
	70-1CC-R259 SH 1	903				
	70-1CC-R259 SH 2	903				
	70-1CC-R416 SH 1	901				
	47A464-2-161	0				
	47A464-2-208	1				
	47A464-2-2360	2				
	47A464-9-1	2		10-5-82		
	70-1CC-R268 SH 1	904		10-14-82		
	47A450-3-66	2		10-14-82		
	47A464-10-11	4		10-14-82		
	47A450-2-80	1		10-18-82		
	67-1ERCW-R336 SH 1,2	903		10-25-82		
	70-1CC-R341 SH 1,2	906		10-25-82		
	47A464-2-9	2		10-25-82		
	47A450-3-74	2		10-29-82		

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FFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1+2	70-1CC-V448	903	1-25-83	1-12-83		2
	↓ -R354	904	↓	1-19-83	VOIDED	↓
2	70-2CC- R010	902	2-15-83	2-8-83		2
2	-R011	903	↓	↓		
2	70-2CC- R018	901	2-15-83	2-1-83		
1	R022	901				
	R023	901				
	R028	902				
	R031	905				
	R035	901				
	R036	901				
	R038	902				
	R040	902				
↓	R045	903	↓	↓		↓
1&2	47W464-5	15	1-31-83	1-26-83		2
↓	-8	17	↓	↓		↓
↓	-11	16	↓	↓		↓
2	47A464-5-19	1	3-15-83	3-9-83		2
2	47A464-2-158	2	2-15-83	2-8-83		2
2	47A464-2-157	7	2-15-83	2-1-83		2
↓	-2-159	5	↓	↓		↓
↓	-2-160	6	↓	↓		↓
↓	-2-167	7	↓	↓		↓
2	47A060-70-42	3	2-15-83	↓		2
	47A464-5-21	2	↓	2-8-83		↓
2	47A464-6-14	1	2-15-83	2-1-83		2
↓	-6-18	3	↓	2-1-83		↓
	-6-10	2	3-11-83	3-9-83		↓
	↓ -6-10A	2	↓	↓		↓
2	47W464-19	10	2-15-83	2-8-83		2
	47A464-6-25	1	↓	3-9-83		2

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AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UP ON DIST/REV. N
2	67-2ERCW-R036	902	2-15-83	1-31-83		2
↓	↓ R166	903	↓	↓		↓
↓	↓ R153	902	↓	2-8-83		↓
	R096		3-15-83	3PL2-9		
	R097		↓	3PL5-9		
↓	↓ R098		↓	3PL6-9		
1	47A450-2-113	1	4-19-83	4-[illegible]-83		2
2	47A060-67-7	3	4-19-83	4-[illegible]-83		2
2	47A060-67-1	3	2-15-83	1-31-83		2
↓	↓ -56	5	↓	↓		2
↓	↓ -59	3	↓	↓		2
2	47W450-4	27	3-15-83	3-11-83		2
2	47W450-10	16	2-28-83	2-21-83		2
2	67-2ERCW-R015	902	5-15-83	5-9-83		2
↓	↓ -R016	902	↓	↓		2
↓	↓ -R017	903	↓	↓		2
↓	↓ -R119	902	↓	5-17-83		2
1	67-1ERCW-R337		5-15-83	3PL2-9		2
1	↓ R614		↓	3PL5-9		↓
1	↓ R170		↓	3PL6-9		
1	47A450-9-57		5-15-83	3PL55		
2	47A450-3-97	2	5-15-83	5-9-83		2

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AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
2	47A464-2-185	4	2-15-83	2-3-83		2
	~~-186~~	0	SPLIT		~~ORIGINAL ISSUE~~	
	-187	1		2-3-83		
	-195	1				
	-197	2				
	-198	1				
	-199	2				
	-215	1				
	-216	2				
	-226	3				
	-230	1				
	-231	1		↓		
	~~-239~~	0		SPLIT	~~ORIGINAL ISSUE~~	
	~~-240~~	0		SPLIT		
	~~-241~~	0		SPLIT		
	~~-242~~	0		SPLIT		
	47A464-5-18	4	↓	2-2-83		
	~~-20~~					
	47A464-10-8	3	2-15-83	2-3-83		
	-9	3				
	-14	2		↓		
	~~-17~~			SPLIT		
	~~-18~~			SPLIT		
	~~-19~~			SPLIT		
	47A464-2-221	2	2-28-83	2-16-83		
	-228	3				
	-229	3				
	70-266-R002	002	2-15-83	3-9-83		2

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AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UP ON DRT REV. N
2	47W464 -3	17	4-15-83	4-5-83		2
	-4	21				
	-6	20				
	-7	19				
	-12	22				
	-16	18				
	-18	15				
	-23	7				
	~~24~~ SEE 47					
2	47W464 -2	22	4-15-83	4-7-83		2
	-13	14				

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FROM	TO	DRAWING OR S/M NUMBER	CHG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
							2
1		67-1ERCW-R118	904	6-17-83	6-14-83		
		-R162	903		7-21-83		
		~~-R173~~			Delete	Transferred to ECN 3217	3
		~~-R525~~				Transferred to ECN 3049	3
		~~-R547~~					3
		~~-R447~~					3
		~~-R336~~					3
2		67-2 ERCW-R114	902	6-17-83	6-14-83		
		-R118	902		6-8-83		
		-R119	902		6-8-83		
		-R120	903		6-8-83		
		~~-R116~~			TWD 7-1	TRANSFERRED TO ECN 2756	4
		-R157			JBL 6-1		4
					JBL 6-1		
1		47A450-67-6			JBL 6-1		
1		-46			JBL 6-1		
2		-90			JBL 6-1		
1		47A450-2-78	2	6-17-83	6-14-83		
1		47A450-21-5		6-17-83	Delete	Transferred to ECN 2756	3
		-34			JBL 6-1		3
		-90					
1		~~47A450-4-36~~		~~6-17-83~~			4
		~~47A450-3-76~~		~~6-17-83~~			4

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DATA SHEET NO. _____

BRANCH

PAGE

To: _____

From: Design Project Manager _____ Released By: _____
Design Project Manager

Date: _____

Preparing Section	MEDS Accession No.		MEDS Accession No.	
Prepared By:	R 0		R 4	
Total Pages (RO):	R 1		R 5	
Section Supervisor:	R 2		R 6	
Staff Eng. or Architect:	R 3		R 7	
Group Head:				
Branch Chief: Date				

SCOPE

Project _____ Affected Units _____

System or Feature _____

Reference & Description of Change _____

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES

Regn. No. _____
Field Materials as follows:

Additional Information:

CHIEF, COST PLANNING AND CONTROL STAFF, W12C70 C-K
CHIEF, ARCHITECTURAL SUPPORT BRANCH, W4C120 C-K
CHIEF, CIVIL ENGINEERING BRANCH, W9D220 C-K
CHIEF, ELECTRICAL ENGINEERING BRANCH, W9C220 C-K
CHIEF, SPECIAL DESIGN PROJECTS, W9D224 C-K

PLANT SUPERINTENDENT
CONSTRUCTION PROJECT MANAGER
MEDS, W9B1 C-K
ARMS, 640 CST2-C

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PAGE 14

A/	TO	DRAWING OR B/M NUMBER	CHG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
							2
1		1-70-159	903	6-15-83	6-8-83		
↓		1 -883	902	↓	↓		
2		70-2CC-V004	902	6-15-83	6-8-83		
↓		1 -R005		↓	↓		
2		2-70-045	901	6-15-83	6-8-83		
		-046	902				
		-208	901				
		↓ -828	902	↓	↓		↓
		~~Estimate for U2 = 40~~				Delete 6	6

TENNESSEE VALLEY AUTHORITY
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ENGINEERING CHANGE NOTICE NO. _____
DATA SHEET NO. _____

BRANCH

PAGE 1

To: _____

From: Design Project Manager _____ Released By: _____ Design Project Manager

Date: _____

Preparing Section	MEDS Accession No.		MEDS Accession No.	
Prepared By:	R0		R4	
Total Pages (R0):	R1		R5	
Section Supervisor:	R2		R6	
Staff Eng. or Architect:	R3		R7	
Group Head:				
Branch Chief: Date				

SCOPE

Project _____ Affected Units _____

System or Feature _____

Reference & Description of Change _____

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES

Regn. No. _____

Field Materials as follows:

Additional Information:

CHIEF, COST PLANNING AND CONTROL STAFF, W12C70 C-K
CHIEF, ARCHITECTURAL SUPPORT BRANCH, WKC12G C-K
CHIEF, CIVIL ENGINEERING BRANCH, W400Z0 C-K
CHIEF, ELECTRICAL ENGINEERING BRANCH, WKC12G C-K
CHIEF, SPECIAL DESIGN PROJECTS, W400Z0 C-K

PLANT SUPERINTENDENT
CONSTRUCTION PROJECT MANAGER
HEAD, W5A82 C-K
ADMS, 640 C0T2-C

0 6 7 0

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BRANCH WBP
PAGE 1

To: _____

From: NPD Project Manager _____ Released By: _____ NPD Project Manager

RO SWP 820930506

ng Section	WM6-4
Prepared By:	Date
Total Pages (RO):	
Section Supervisor:	BOC
Staff Eng. or Architect:	
Group Head:	AS
Br. Chief/ SOP Mgr.:	

MEDS Accession No.	MEDS Accession No.
WBP 840525 548	

SCOPE

Project _____ Affected Units _____

System or Feature _____

Reference & Description of Change _____

CLOSED

DATE _____

CLOSURE SH. # _____

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
8	5-23-84	MK	BOC	AS	CAC	MK	[illegible]	Delete unit2 est. see unit2 ECN 4857	17

to. _____

...aterials as follows:

Additional Information:

TVA 10875A (EN DES-2-83)

[redacted] [redacted]

TENNESSEE VALLEY AUTHORITY
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ENGINEERING CHANGE NOTICE NO. ________
DATA SHEET NO. ________

PAGE ☐

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV.

0 6 7 2

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DATA SHEET NO. 5

BRANCH SWP

PAGE 2

Watts Bar Nuclear Plant, Spring City, TN

To:

From: Design Project Manager SWP 204 GB-K

Released By: James C Key/le
for Design Project Manager

Date: SEP 30 1982

Originating Section	MEDS Accession No.		MEDS Accession No.	
WMG #4	RO	SWP '82 0930 506	R4	WBP '831013 505
Prepared By: S. J. Simon	R1	SWP '82 1104 535	R5	WBP '840201 509
Total Pages (RO):	R2	WBP '830811 507	R6	WBP '840227 501
Section Supervisor: B.D. Sewell	R3	WBP '830914 503	R7	WBP '840326 508
Staff Eng. or Architect: N/A				
Group Head: James C Key/le				
Branch Chief: Date				

SCOPE

Project: Watts Bar Nuclear Plant — Affected Units: 1 & 2

System or Feature: Various Piping Systems, Reference W3NSWP8148 & W4NSWP8108

Reference & Description of Change: Revised piping and hanger drawings to reflect the latest analysis and location changes.

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	O.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
1	11-4-82	EHH	BDS	JKH/e	N/A	CE	JCS/e	~~CHANGED HEAD BARS~~ ADDED ~~SPWP1114~~ DWGS	15
2	8-11-83	JJH	BDS	JKH/e	N/A	MK	JCS/e	Added estimated No. of Pwgs for Unit 2	15
3	9-14-83	JJH	BDS	JKH/e	N/A	MK	JCS/e	Also Added 1 dwg for Unit 2 & revised estimate	15
4	12-13-83	JBL	BDS	JKH/e	N/A	MK	JCS/e	Added new dwg on pg 15	15
5	2-1-84	LGG	BDS	JKH/e	/	MK	JCS/e	ADDED DWG ON PAGE 15 TO VOID	15
6	2-27-84	LGG	BDS	JKH/e	/	MK	JCS/e	CHGD REV ON PAGE 11; DELETED DWG ON PG 12	15
7	3-26-84	LGG	BDS	JKH/e	CAC	MK	JCS/e	DELETED DWG ON PG 15	15

No.

d Materials as follows:

Additional Information:

CHIEF, COST PLANNING AND CONTROL STAFF, W12C70 C-K
CHIEF, ARCHITECTURAL SUPPORT BRANCH, W6C126 C-K
CHIEF, CIVIL ENGINEERING BRANCH, W9B220 C-K
CHIEF, ELECTRICAL ENGINEERING BRANCH, W6C126 C-K
CHIEF, SPECIAL DESIGN PROJECTS, W12B26 C-K

PLANT SUPERINTENDENT
CONSTRUCTION PROJECT MANAGER
MEDS, W12M3 C-K
ADMS, E40 C57C-K

0-6-73

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DATA SHEET NO. 2

page 3

AFFECTED UNIT	DRAWING OR SKM NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE ITEM ON DATA REV.
1&2	47W 464-20	R11		1-27-82		
	47W 464-13	R15				
	" -18	R11				
	" -17	R14				
	" -14	R14				
	" -3	R15				
1	78-1EPC-V27 SH 1	R1		1-30-82	HGR DET Sheets	
	" " " SH 2					
	" " " SH 3					
1	47A 464-20-2	R0				
	1-70-75	R1				
	1-70-76	R2				
	1-70-105	R4				
	1-70-371	R2				
	1-70-102	R3				
1&2	47W 454-2	R23		2-2-82	Piping Dwg. Mod.	
1	1-70-207	5		2-22-82	Hgr. Dwgs	
1	47A 464-6-39	2		2-22-82		
	1-70-93	1		2-12-82		
	1-70-91	1				
	1-70-958	3				
	" " 951	6				
	" " 952	5				
	" " 953	2				
	" " 208	4				
	" 209	3				
	47A464-2-178	2		3-9-82	Rev. Plan	
	-2-183	4			Rev. Dia.	
	70-1CC-RG52 (SH 1)	2			Rev. B/M	
	(SH 2)	2				
	47A464-2-175	2			Rev. Plan	
	" " 172	4				
	1-70-101 SH 1	3				
	" " " SH 2	3				
	1-70-226 SH 1	3				
	" " " SH 2	3				

TVA 10878E (EN DES-7-79)

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DATA SHEET NO. 5

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AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	47A464-2-173	1		3-9-82	REV. EL & PLAN	
	1-70-222 SH1	1				
	SH2	1				
	SH3	1				
	SH4	1				
	1-70-250 SH1	1			REV DIMS	
	" " SH2	1				
	1-70-266 SH1	1				
	" " SH2	1				
	1-70-980 SH1	1				
	SH2	1				
	70-1CC-R637	2			REV JT NAME	
	47A464-2-10	2			REV DIMS	
	47A060-70-18	4			"	
	47A060-70-51	2			"	
	70-1CC-R644	2			REVISE SUPPORTS	
	70-1CC-R657	1				
	70-1CC-R631 SH1	5				
	" " " SH2	5				
	" " " SH3	5				
	70-1CC-R735	1				
	70-1CC-R11	3				
	47W859-4	7		3-15-82	CCS FLOW DIAG	
	47W464-2	20			REVISED SUPPORTS	
	47W464-4	19			"	
	47W464-6	17				
	47W464-5	13				
	47W464-8	15				
	47W464-10	14				
	47W464-11	13				
	47W464-12	19				
	47W464-13	12				
	47W464-16	15				
	47W464-17	17				
	47W464-18	12				
	47W464-19	16				

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AFFECTED UNIT	DRAWING OR B/M NUMBER	OWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPD. ON DATA REV. NO
1 & 2	47W 854-2	23	2/1/82	2/2/82		
1	28-1FPC -V27 SH1		1-30-82	1-30-82		
	-V27 SH2					
	-V27 SH3					
2	47A060-70-38	R4	5-5-82	5-6-82		
1	47A060-70-36	R2				
1	1-70-854 SH1	4				
1	1-70-854 SH2	4				
1	1-70-842 SH1	4				
1	1-70-842 SH2	4				
1	1-70-842 SH3	4				
1	1-70-841 SH1	5				
1	1-70-841 SH2	5				
1	1-70-831 SH1	2				
1	1-70-831 SH2	2				
1	1-70-829 SH1	5				
1	1-70-829 SH2	5				
1	1-70-820 SH1	5				
1	1-70-820 SH2	5				
1	1-70-817 SH1	1				
1	1-70-817 SH2	1				
1	1-70-175	4				
1	70-1CC-R572	3				
1	70-1CC-R565 SH1	4				
1	70-1CC-R565 SH2	4				
1	70-1CC-R561	2				
1	70-1CC-R560 SH1	4				
1	70-1CC-R560 SH2	4				
1	70-1CC-R559	1				
1	70-1CC-R550	1				
1	70-1CC-R535	4				
1	70-1CC-R534	1				
1	70-1CC-R528 SH1	5				
1	70-1CC-R528 SH2	5				
1	70-1CC-R199 SH1	6				
1	70-1CC-R199 SH2	6	5-5-82	5-6-82		

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AFFECTED UNIT	DRAWING OR BOM NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	70-1CC-R1045 1	R7	5-5-82	5-6-82		
1	70-1CC-R1045 2	7	"	"		
1	70-1CC-R71	2	"	"		
1	70-1CC-R51	3	"	"		
1	70-1CC-R46	3	"	"		
1	70-1CC-R39	3	"	"		
1	70-1CC-R16	2	↓	↓		
1&2	47A464-4-153	2	5-5-82	5-6-82		
1	47A464-4-1	2	5-10-82	5-28-82		
1&2	47A464-2-248	1	↓	5-21-82		
"	47A464-10-2	1	↓	5-21-82		
"	47A464-11-2	1	5-10-82	5-21-82		
1	70-1CC-R525	3	5-14-82	5-14-82		
1	47A464-4-6	1	5-21-82	5-21-82		
1	47A464-4-11	3	↓	↓		
1	70-1CC-R489	2	"	"		
"	70-1CC-R501	2	"	"		
1	70-1CC-R502	2	"	"		
1	70-1CC-R505	2	"	"		
1	70-1CC-R506	2	"	"		
1	70-1CC-R508	2	"	"		
1	70-1CC-R509	2	"	"		
1	70-1CC-R593	3	"	"		
1	70-1CC-R594	2	"	"		
1	70-1CC-R606	2	↓	↓		
1	47A464-2-246	1	5-21-82	5-21-82		
1	70-1CC-R91	4	5-27-82	5-27-82		
1	70-1CC-R610	3	5-27-82	5-27-82		
1	70-1CC-R682	2	5-27-82	5-27-82		
1	70-1CC-V631	4	5-27-82	5-27-82		
"	70-1CC-R96	4	6-15-82	6-15-82		
1	70-1CC-R747	2	6-17-82	6-17-82		
1	47A060-70-8 R6	6	"	"		
1&2	47A464-3-158	2	"	"		
1&2	47A464-2-235	2	↓	↓		
1&2	47A464-2-235A	2	6-17-82	6-17-82		

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AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA REV. N
1&2	47A464-2-235B	0	6-17-82	6-17-82		
1	70-ICC-R161	1	6-18-82	6-18-82		
1	" R163	1				
1	" R178	1				
1	" R286	1				
1	" R285	2				
1	" R292	1				
1	" R299	2				
1	" R300	3				
1	" R301	2				
1	" V464	1				
1	" R474	2	6-18-82	6-18-82		
1+2	47W464-6	18	6-18-82	6-18-82		
	47W464-7	17				
	-8	16				
	9	16				
	10	15				
	11	14				
	12	20				
	14	16				
1	16	16				
1	17	18				
1	47W464-18	13	6-18-82	6-18-82		
1	70-ICC-R279	4	6-28-82	6-28-82		
1	1-70-163	1	6-30-82	6-30-82		
1	153	1				
1	154	1				
1	868	1				
1	869	1				
1	872	2				
1	877	3				
1	880	3				
1	70-ICC-R170	6	6-30-82	6-30-82		
1&2	47A464-2-237	0	7-1-82	7-1-82		
"	" " -237A	2	7-1-82	7-1-82		
"	" " -237B	2	7-1-82	7-1-82		

TVA 10975E (EN DES-7-79)

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"FECTED INIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1 2	47A464-2-212	3	7-1-82	7-1-82		
"	" " -204	3				
"	" -4-160	1				
"	" -4-160A	1				
1	70-1CC-R176	1				
1	" " R29	2				
1	1-70-897	1				
1	" -977	2				
2	2-70-084	1				
2	" -199	1	↓	↓		
2	" -321	1	7-1-82	7-1-82		
1	70-1CC-R118	3	7-19-82	7-19-82		
	" 119	2				
	" 121	2				
	" 123	1				
	" 125	2				
	" 126	2				
	" 128	2				
	" 129	1				
	" 132	4				
	" 134	2				
	" 142	1				
	" 143	1				
	" 144	1				
	" 145	3				
	" 147	2				
	" 148	1				
	" 149	2				
	" 151	1				
	" 152	1				
	" 189	2				
	" 192	1				
	" 194	4				
	" 213	2				
↓	" 271	1				
1	" 272	1	↓	↓		

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AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA REV. N
1	70-1QC-R273	1	7-19-82	7-19-82		
	275	1				
	276	1				
	278	1				
	280	2				
	282	3				
	311	5				
	480	2				
1	677	1				
	1-70-136	2				
	137	2				
	830	2				
	884	1				
	911	4				
	917	1				
	918	3				
1	919	3				
2	2-70-173	1				
2	174	1				
2	951	1				
1&2	47A464-2-206	2	↓	↓		
1&2	" -209	3	7-19-82	7-19-82		
1	70-1CC-R120	3	8-4-82	8-4-82		
	124	2				
	137	4				
	139	1				
	190	3				
	228	1				
	116	1				
	117	1				
	135	2				
	136	3				
	223	1				
	229	2				
	266	2	↓	↓		
1	267	1	8-4-82	8-4-82		

TVA 10878E (EN DES-7-79)

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AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	70-1CC-R193	2	8-4-82	8-4-82		
	270	1				
	310	1				
	274	1				
	419	2				
1	420	1				
2	2-70-175	1				
2	192	1				
1 & 2	47A464-2-202	1	8-4-82	8-4-82		
1	70-1CC-R122	2	8-6-82	8-6-82		
	130	6				
	140	1				
	263	3				
	269	2				
	312	2				
	332	5				
	367	3				
	373	1				
	431	2				
	138	2				
	212	4				
	241	1				
	244	2				
	247	1				
	248	2				
	253	4				
	255	4				
	256	2				
	257	2				
	316	1				
	317	2				
	321	3				
	328	4				
	344	2				
	345	2				
1	361	3	8-6-82	8-6-82		

TVA 10879E (EN DES-7-79)

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AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATE ON DATA REV. NO.
1	70-1CC-R370	1	8-6-82	8-6-82		
	371	3				
	376	3				
	401	2				
	403	1				
	404	5				
	405	2				
	411	2				
	438	4				
	439	3				
	1-70-125	2				
	131	1				
	133	2				
	146	3				
	147	3				
	148	2				
	152	3				
	891	3				
1	914	6				
1 & 2	47A464-2-7	3	8-6-82	8-6-82		
"	-3	2	8-7-82	8-7-82		
"	-5	4				
"	-5A	4				
1 & 2	-3-131	3				
1	70-1CC-R150	2				
	220	5				
	368	3				
	397	2				
	408	1				
	452	1				
1	1-70-310	3	8-7-82	8-7-82		
1	70-1CC-R146	2	8-11-82	8-11-82		
	242	4				
	410	3				
	424	6				
1	1-70-160	3	8-11-82	8-11-82		

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AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	47A060-70-32	3	8-11-82	8-11-82		
1 & 2	47A464-2-201	2				
1	70-1CC-R159	1				
	222	2				
	342	7				
1	450	2				
2	47A464-2-4	2				
1 & 2	179	2				
"	-3-135	1				
1	70-1CC-R131	4				
	191	2				
	230	5				
	231	4				
	√232	38			Dwg R3 not R5	6
	339	1				
	358	5				
	363	2				
1	374	1				
1 & 2	47A464-2-203	3				
"	-210	2				
"	-10-13	2				
1	70-1CC-R250	1				
	262	2				
	379	3				
	402	1				
	407	1				
	440	4				
1	1-70-155	4				
1 & 2	47A464-9-149	2	8-11-82	8-11-82		
	47W464-2	21	8-12-82	8-12-82		
	-3	16				
	-4	20				
	-5				NOT REQUIRED	
	-6	19				
	-7	18				
1 & 2	-8	16	8-12-82	8-12-82		

TVA 10975E (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2576

DATA SHEET NO. 5

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA REV. #
1&2	47W464-9	17	8-12-82	8-12-82		
	-10	16				
	-11	15				
	-12	21				
	-13	13				
	-14	17				
	-15	8				
	-16	17				
	-17	19				
	-18	14				
	-19	17				
1&2	-20	12				
2	-22	8				
2	-23	6				
1&2	-24	10	8-12-82	8-12-82		
~~1~~	~~70-ICE-R70~~	~~1~~	~~8-17-82~~	~~8-17-82~~	DELETE	6
	214	1	8-17-82	8-17-82		
	277	3				
	372	2				
	394	5				
	487	1				
	1-70-159	3				
	883	2				
	47A060-70-31	2				
	35	4				
	47A464-2-8	5				
	163	0				
1	207	2	8-17-82	8-17-82		
	70-ICC-R221	5	9-1-82	9-1-82		
	240	4				
	325	3				
	360	1				
	378	3				
	395	2				
	442	4				
1	47A464-2-233	4	9-1-82	9-1-82		

TVA 10979E (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2576

DATA SHEET NO. 5

AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	47A 464-2-247	5	9-1-82	9-1-82		
	247A	5				
	1-70-132	3				
	134	2				
	138	3				
	145	3				
	151	4				
	161	3				
	870	2				
1	885	2				
2	2-70-131	1				
	142	1				
	147	1				
	157	1				
	158	1				
	817	1				
	824	2				
	70-2CC-V6	2				
	R11	2				
2	14	4	9-1-82	9-1-82		
1	70-1CC-R260	1	9-2-82	9-2-82		
	261	2				
	264	3				
	265	3				
	355	4				
	425	2				
	446	3				
	449	2				
	1-70-906	2				
	909	1				
	858	5				
1	819	4	9-2-82	9-2-82		
1	70-1CC-R245	1	9-3-82	9-3-82		
2	70-2CC-R12	3	"	"		
2	2-70-159	1	"	"		
1	70-1CC-R133	4	9-7-82	9-7-82		

TVA 10979E (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2576

DATA SHEET NO. 5

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPON ON DATA REV. NO
1	70-1CC-R234	5	9-7-82	9-7-82		
1	26-1FP-R114	R903	9-30-82	9-28-82		
1	R178	R903				
1	R134	R903				
1	R214	R904				
1	R207	902				
1	R175	904				
1	R234	903				
1	R179	404				
1	R99	R902				
1	R139	R901				
1	R245	R904				
1	R103	R902				
1	R248	R903				
1	R123	R901				
1	R106	R905				
1	R120	R901				
1	R242	902				
1	R238	902				
1	R236	901				
1	R239	901				
1	R227	903				
1	R205	905				
1	R204	901				
1	R97	902				
1	R216	901				
1	R226	904				
1	R128	405				
1	R129	405				
1	R197	902		↓		
1	R215	903		10-1-82		
1	R119	902		↓		
1	R201	903		↓		
1	R249	903		10-7-82		
1	R209	901	↓	10-7-82		
1	47A060-26-2	2		10-7-82		

[redacted] [redacted]

TVA 10575E (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2576

DATA SHEET NO. 5

PAGE 16

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	47A060-26-2A	0	9-30-82	10-7-82		
1	47A060-26-13	3		10-7-82		
1	" -26-17	3				
1	" -26-17A	1				
1	" -26-17B	1				
1	" -26-17C	1				
1	47A491-8-34	0		10-1-82		
1	47A491-8-32	0		10-1-82		
1	47A491-8-2	1	10-30-82	10-7-82		
1 & 2	47W491-8	30	10-30-82	10-25-82		
	47W491-21	9				
	47W491-47	8				
	47W491-9	28		10-25-82		
~~2~~	~~43 Dwgs maximum estimated for unit 2 expected issue date 5-1-84~~				Delete	8
2	47A492-4-6	R1	9-15-83	9-12-83		3
2	47A492-2-12	1	10-17-83	10-18-83	new dwg	4
~~1~~	~~47A491-8-34~~	~~1~~	~~2-3-84~~	~~2-1-84~~	~~VOID DWG~~ DELETE DWG VOIDED UNDER ECN 4062	5

TVA 10675E (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2576

DATA SHEET NO. 5

PAGE 17

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UP... ON DAT. REV. N...

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2526
DATA SHEET NO. 6

BRANCH CEB
PAGE 1

To: [redacted]

From: NPD Project Manager
4-19-93

Released By: [redacted]
NPD Project Manager

Preparing Section: TVA CESB-PAS #4		MEDS Accession No.	MEDS Accession No.
Prepared By: T. L. MEANS Date	R0	WBP '230419 505	R4
Total Pages (RO): 2	R1		R5
Section Supervisor: [redacted]	R2		R6
Staff Eng. or Architect:	R3		R7
Group Head: Thomas C Crouse			
Br. Chief/ SDP Mgr.: R.O. Barnett			

SCOPE

Project: WATTS BAR NUCLEAR PLANT — Affected Units: 1 & 2

System or Feature: COMPONENT COOLING WATER & SPENT FUEL PIT SKIMMER [illegible]

Reference & Description of Change: Revised drawing to show as installed support locations.

CLOSED
DATE
CLOSURE SH. #

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES

No. [redacted]

Field Materials as follows:

Additional Information:

TVA 10578A (EN DES-2-83)

[redacted]

[redacted]

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2526
DATA SHEET NO. 6

AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL		REMARKS	LINE UPDATE ON DATA REV.
2	47W464-229	7	4-15-83	4-21-83		N3-70-36A, 37A	
2	47B464-416	2	"	4-21-83		N3-70-37A	
1	47W464-230	5	4-15-83	4-21-83		N3-70-29A, 30A	
1	47B464-467	1	"	↓		N3-70-29A	
1	47B464-468	2	"	↓		N3-70-30A	

[redacted]

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2576
DATA SHEET NO. 7

BRANCH CEB
PAGE 1

To: Watts Bar Nuclear Plant, Spring City, TN

Attn: NPO Project Manager SWP 204 C8 K

Released By: [signature] NPO Project Manager

Date: 7-13-83

Preparing Section	MEDS Accession No.		MEDS Accession No.
Prepared By: [signature] Date 6-30-83	R0 WBP '830713 523	R4	
Total Pages (RO): 2	R1	R5	
Section Supervisor: [signature]	R2	R6	
Staff Eng. or Architect: [signature]	R3	R7	
Group Head: [signature]			
Br. Chief/ SDP Mgr.: [signature]			

SCOPE

Project WATTS BAR NUCLEAR PLANT Affected Units 1

System or Feature VARIOUS PIPING SYSTEMS (FEEDWATER)

Reference & Description of Change ADDITION OF PIPE SUPPORT NUMBERS TO THE RIGOROUS ANALYSIS ISOMETRIC DRAWINGS

DATE

CLOSURE SH. #

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES

Field Materials as follows:

Additional Information:

[redacted]

[redacted]

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2576
DATA SHEET NO. 7

AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UP ON DAT/ REV.
1	47W401-208	2	7-15-83	7-20-83	01000200-02-01	
	" -209	2			" -02-02	
	" -210	2			" -02-03	
	" -211	2			" -02-04	

[redacted]

TVA 10570C (EN 0B-60-83) **ENGINEERING CHANGE NOTICE**

COVER SHEET SWP '82 0813 500

(BEFORE ISSUANCE OF OPERATING LICENSE)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

This ECN has been Rescoped to Delete Unit 2 work unissued RIS of 4-20-84, Remaining Unit 2 work will be implemented under ECN 4784 MCB 4-20-84

ECN NO. 3198

To: Construction Project Manager Watts Bar Nuclear Plant, Spring City, Tn

From: Design Project Manager SWP 204 GB-K

8406040008 (20)

DATE AUG 13 1982

Budget Items: 221
Transfer Package: X-03(2), 12/82

Was IJ Analysis Required: Yes ____ No X

WB Yarnish — Prepared by
WMG #2 — Section
J Runkle — Section Leader
Project Engineer
Released: H B Rankin — Design Project Manager — 8-12-82 Date

SCOPE All WORK PACKAGES - M003F20 M003F29.

Project Watts Bar Nuclear
Affected Unit(s) 1 & 2
System or Feature Aux Feedwater, Sys 3B (NCR 3755 R, rev 1)
Reference & Description of Change In the Aux Feedwater Sys. Revise various piping & drawings to specify Code class and vendor package boundries (work packages M003F20 & M003F29) and reanalize Code piping on the Aux Feedwater pump packages

DRAWINGS OR B/M'S INVOLVED: (Data Sheets Required)

	Yes or No	Date Branch Data Sheet Available
Thermal Power Engineering Branches		
Civil NA #2	Yes	
Electrical	No	
Mechanical	No	
Nuclear	No	
Thermal Power Engineering Des Project		
Civil	No	
Electrical	No	
Mech #2	Yes	5-21-82
Analysis		
Arch, Hydro, & Spec Proj Eng & Des		
Arch	No	
Civil	No	
Electrical	No	
Mech	No	

DATE CLOSED SH. # 131

Thermal Power Engineering Branches Approval Required	Yes or No
	Yes
ECN is ready for TPE Branch review: Design Project Manager for — Date	6-29-82
Approved: TPE Civil Br. Chief — Date	
TPE Electrical Br. Chief — Date	
TPE Mechanical Br. Chief — Date	7/27/82
Chief Nuclear Engineer — Date	

WDP 840521 532

	Yes or No
Required for PSAR or FSAR	Yes
Required for Preoperational Test:	Yes
If Yes, Test No.	TVA 22
Vendor Backcharges Involved	No
Seismic Analysis Required	Yes
Nonconformance Report Required	Yes
QA Applies	Yes
Security System Modified	No
Vendor(s) involved:	Yes NO

PHYSICAL WORK MUST BE DONE BEFORE:

		Pre-Op Test	1st Fuel Load	1% Therm Power	Comm'l Oper'n	1st Refuel	
Unit(s)	1	✓					
Unit(s)	2	✓					

8408270558

CC (Attachments): (Yes) (Yes)
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, W8C126 C-K
Chief, Electrical Engineering & Design Branch, W2D224 C-K
MEDS, 100 UB-K
Chief, Nuclear Engineer, W10C126 C-K
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, E7B24 C-K
Chief, Cost Planning and Control Staff, W12C74 C-K
Plant Superintendent

TVA 44 (08-1-81)

UNITED STATES GOVERNMENT

Memorandum

ECN NO. 3755 ATTACHMENT 1 SHEET 1 OF 4

RETURN TO RT FOR FILE

TENNESSEE VALLEY AUTHORITY

MEB '82 0603 008

TO : J. E. Wilkins, Project Manager, Watts Bar Nuclear Plant, CONST (3)

FROM : J. C. Standifer, Sequoyah and Watts Bar Design Projects Manager, 204 GB-K

DATE : JUN 3 1982

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 (MEB 820427 260).

We were informed by your J. F. Hagy that WBN-NCR-3755R-R1 supersedes WBN-NCR-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 manufactured 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 equipment.

RETURN TO RT FOR FILE

J. E. Wilkins

JUN 3 1982

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

NCR'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/in^2g) passing out of the drain collection header into the turbine room where it would seriously degrade the turbine room environment. These traps were procured directly by TVA to Seismic Class I (L), Safety Class G requirements, and represent the best available commerical grade product of standard manufacture. The traps have

3

ECN NO. 3100
ATTACHMENT 1
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/in^{2}g and are being utilized in a drains system with a design pressure of 5 lb/in^{2}g. This represents a very conservative design margin for the traps. A failure of the traps in the open position would cause a 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

[redacted]

[redacted]

ECN NO 3194X
ATTACHMENT 1
SHEET 4 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

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/in^{2}a 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, E7B24 C-K
M. N. Sprouse, W11A9 C-K
J. A. Raulston, W10C126 C-K
MEDS, W5B63 C-K

Principally Prepared By: R. Tucker, extension 4581

E82152.07

[redacted] [redacted]

ECN NO. 3198
ATTACHMENT 2
SHEET 1 OF 2

DIVISION OF CONSTRUCTION

NONCONFORMING CONDITION REPORT

NEP-QC1-1.2
ATTACHMENT A1

LOP

1. Nuclear Project: WATTS BAR NUCLEAR PLANT | Unit 1 | NCR: 3755R A1

2. Area: ☐ Civil ☐ Electrical ☒ Mechanical ☐ Instrumentation ☐ Welding | ASME Code Item ☐ Yes ☐ No

3. Activity ☐ Receiving ☐ Storage ☐ Fabricating ☒ Installing ☐ Other ☐ Testing | Contract No. 74C30-83094 326590

4. Type: ☐ Damage ☐ Failure ☐ Defect ☒ Documentation ☐ Other _____

5. Item Description: See attachment A2 Drawing #47W427-8,R10

6. Nonconformance Description: (Include Apparent Cause) 1) No objective evidence exists that these items conform to ASME class 3, TVA class C, 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: (Check Block & Detail Below) ☐ Rework ☐ Reject ☐ Repair ☐ Use-As-Is ☒ Other
EN DES to review item acceptability and provide appropriate quality standards and design conditions.

Action Required to Prevent Recurrence:
NONE

REVISION 1 TO INCLUDE ADDITIONAL MATERIAL

NCR Initiator: DPO J. F. Hazy Date February 5, 1982

7. Referred to Design Project Organization (DPO): ☐ Yes ☐ No DPO Coordination Contact _____
Disposition: ☐ As Recommended ☐ Other (Describe). Significant Condition ☐ Yes ☐ No

Approved by Construction Engineer: _____ Date: _____

8. DPO Disposition: ☐ As Recommended ☐ Other (Describe)

Approved by Design Project Organization: _____ Date _____

9. Disposition Inspection and Release from Nonconforming Status: ☐ Yes ☐ No

Inspected by: _____ Date _____

10. Action Required to Prevent Recurrence Complete: ☐ Yes ☐ No

Verified by Construction Engineer: _____ Date _____

Distribution:
Site QA Records File
Construction Engineer
Project QA Unit
QA Manager, OEDC
Design Project Organization (Items for his action only)
Authorized Nuclear Inspector (Code items only)
EN DES NEB-NLS (Significant NCR's only)
OMS NSRS (Significant NCR's only)
MEDS

Disposition Reviewed and Accepted By:

_____ _____
Authorized Nuclear Inspector Date

0736

ATTACHMENT A2 R0

Tennessee Valley Authority: Watts Bar Nuclear Plant	NONCONFORMING CONDITION REPORT CONTINUATION PAGE	NCR No. 3799R R1

Item No.	REMARKS
1.	Jet Compressor (DWG. # 760-X1D4J, R1) (1)
2.	1-PCV-3-183 (DWG. # 10/2.4.1.8) (1)
3.	Steam Traps, MK # 4TW-27-2, SARCO INSTALLATION INSTRUCTIONS NO. 360-07 July, 1979) (1)
4.	Oil Coolers (AMETEC DWG. # 5-44143-A-042) (2)
5.	Oil Coolers (AMERICAN STANDARD DWG. # 5-142-02-018-015) (2)
6.	Manifold Piping (I-R DWG. # 3-3HMTA 321x39A and 3-5HMTA321x90D) (2)
7.	Oil Piping (TST DWG. #884020 and I-R DWG. # 3-5HMTA321x101A) (2
8.	Oil Piping (I-R DWG. # 3-3HMTA321x40A) (2)
9.	Governor Valve (TST DWG. # 670630) (2)
10.	Trip & Throttle Valve (DIMPEL DWG. # MP-1355) (2)
11.	Lube Oil Console (I-R DWG. # 3-3HMTA321x37A) (2)

ECN NO 3799
ATTACHMENT 2
SHEET 2 OF 2

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3198
DATA SHEET NO. 1

BRANCH SSMB
PAGE 1

To: _____

Attn: NPG Project Manager _____ Released By: _____ NPG Project Manager

OR-13-82

BO SWP 820813 501

Preparing Section		
Prepared By: / Date		
Total Pages (ROI):		
Section Supervisor: JJ NASH		
Staff Eng. or Architect:		
Group Head:		
Br. Chief/ Proj. Mgr.:		
RELEASED	WBP '84 0124 500	WBP '84 0427 556
RELEASED	WBP '84 0229 509	
RELEASED	WBP '84 0412 511	
RELEASED	WBP '84 0417 508	

SCOPE

Project _____ Affected Units _____

System or Feature _____

Reference & Description of Change _____

CLOSED

DATE

CLOSED

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PREPARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
8	1-24-84	JDW		JSH	N/A	MK		DELETE 2 Supports & ADD 3 supports	6
9	2-29-84	Dwc		JKH	ROS	MK		ADDED 47W703-3 & 47W627-9	6
10	4-12-84	RLT		JKH	ROS	MK		ADDED 1 UNIT 1 DUKE	6
11	4-17-84	RLT		JKH	ROS	MK		ADDED 1 UNIT 1 DUKE	6
12	4-27-84	mk		JSH	ROS	mk		Delete U2 Est U2 ECN 4786	6

R. _____

Field Materials as follows:

Additional Information:

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. ________
DATA SHEET NO. ________

PAGE ☐

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	[illegible] IN DATA REV.

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3198
DATA SHEET NO. 1

BRANCH SWP
PAGE 1

Watts Bar Nuclear Plant, Spring City, Tn

To:

From: Design Project Manager SWP 204 C-K

Released By: [signature] Design Project Manager

Date: AUG 13 1982

Planning Section	WMG # 2
Prepared By:	[signature]
Pages (RO):	2
Section Supervisor:	[signature]
Staff Eng. or Architect:	N/A
Group Head:	[signature]
Branch Chief:	[signature] Date

	NRC's Accession No.		NRC's Accession No.
RO	SWP 82 0813 501	R4	SWP 83 0322 513
R1	SWP 82 1129 510	R5	SWP 83 0412 509
R2	SWP 83 0202 539	R6	WBP 830520 520
R3	SWP 83 0314 528	R7	WBP 830811 512

SCOPE

Project Watts Bar Nuclear — Affected Units 1 & 2

System or Feature Aux Feedwater, Sys 3B — NCR 3755 R

Reference & Description of Change In the Aux Feedwater sys. revise various piping and drawings to Specify Code Class and Vender package boundries and to reanalize Code piping on the Aux Feedwater pump packages.

CLOSED

DATE

SEE ASSOCIATED DRAWINGS USE SH # CLOSURE, REVERSE SIDE

REV. NO.	DATE ISSUED	PREPARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
1	[illegible]	DPS	[illegible]	[illegible]	N/A	HH	[illegible]	ADDED [illegible] AND 47W427-2-9 AND MEB'S DWGS	2
2	2-2-83	SLP	[illegible]	[illegible]	N/A	HH	JCS	ADDED HANGERS SH. 3, 4 & 5	5
3	3-14-83	SLP	[illegible]	[illegible]	N/A	HH	JCS	DELETE SUPPORT 47B060-3-34 & ADDED SUPPORT NOS ON PAGE 5	5
4	3-28-83	SLP	[illegible]	[illegible]	N/A	HH	JCS	ADDED SUPPORT NOS ON PAGE 5 & 6 47B427-7-16, 47B427-1-044 SCR 1168	6
5	4-12-83	SLP	[illegible]	[illegible]	N/A	HH	JCS	DELETE SUPPORT 47B427-9-10, 17 & 18	6
6	5-20-83	DPS	[illegible]	[illegible]	N/A	MK	RSK	ADD SUPPORTS 47W803-3 & 47W427-1N, -7, -8, -9	6
7	8-11-83	RLD	[illegible]	[illegible]	N/A	MK	JCS	ADDED SUPPORTS ON PAGE 6	7
8	12-4-84	JDW	[illegible]	[illegible]	N/A	MK	[illegible]	DELETE 2 SUPPORTS & ADD [illegible] SUPPORTS	6

No.

Materials as follows:

Additional Information:

Chief, Cost Planning and Control Staff, W12C74 C-K
Chief, Architectural Design Branch, W4C126 C-K
Chief, Civil Engineering Branch, W9D224 C-K
Chief, Civil Engineering & Design Branch, W3C126 C-K
Plant Superintendent
Construction Project Manager
Chief, Electrical Engineering Branch, W8C126 C-K
Chief, Electrical Engineering & Design Branch, W2D224 C-K
Chief, Mechanical Engineering & Design Branch, 102 SPT-K
MEDS, 100 UB-K
ARMS, 640 CST2-C

TVA 10975A (EN DES-10-81)

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DIVISION OF ENGINEERING DESIGN

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DATA SHEET NO. 1

PAGE 2

AFFECTED UNIT	DRAWING OR SAM NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE IDENTITY OR DATA SHEET REV. NO.
1&2	47W803-2	17	8-30-82	11-23-82	FLOW DIAGRAM	
	" -3	7		11-23-82	" "	0
	47W427-1	12		11-23-82	PIPING DRAWING	0
	" -14					1
	" -7	14		11-23-82		0
	" -8	11		11-23-82		0
1&2	" -2	8	11-16-82	11-23-82		1
"	" -9	0	11-16-82	11-23-82		1
	~~MFR'S DRAWINGS~~					
1&2	D-3HMTA321X37A	901	11-22-82	11-23-82	MFR'S DRAWINGS	1
	C-3HMTA321X40A	901				1
	C-3HMTA321X39	901				1
	C-5HMTA321X90D	901				1
	101716C	901				1
	88402D	901				1
	[redacted]					
1	03B-1AFW-R58 SH.	903	1-26-83	1-26-83	VENDORS SUPPORT DRAWINGS ADDED	2
1	03B-1AFW-R59 SH. 1&2	902		1-26-83		2
1	03B-1AFW-R63 SH. 1&2	902		1-26-83		2
1	03B-1AFW-R65 SH. 1&2	902		1-26-83		2
1	03B-1AFW-R69 SH. 1&2	902		1-26-83		2
1	03B-1AFW-R71 SH. 1	901		1-26-83		2
1	03B-1AFW-R74 SH. 1&2	902		1-26-83		2
1	03B-1AFW-R75 SH. 1&2	902		1-26-83		2
1	03B-1AFW-R76 SH. 1&2	902		1-26-83		2
1	03B-1AFW-R81 SH. 1	902		1-26-83		2
1	03B-1AFW-R82 SH. 1&2	902		1-26-83		2
1	03B-1AFW-R83 SH. 1,2,3	905		1-26-83		2
1	03B-1AFW-R90 SH. 1&2	903		1-26-83		2
1	47A427-1-09 SH. 1	0			TVA ENGINEER DRAWING ADDED	

TVA 10670E (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3198

DATA SHEET NO. 1

AFFECTED UNIT	DRAWING OR SYS NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	03B-1AFW-R58 SH.1	903	3-30-83	1-31-83	VENDOR DRAWING CHANGED TO REV. 47W427-221-B0	2
1	03B-1AFW-R59 SH 1&2	902		1-31-83		2
1	-R63 SH. 1&2	902		1-31-83		2
1	-R65 SH. 1&2	902				2
1	-R69 SH. 1&2	902				2
1	-R71 SH. 1	901				2
1	-R74 SH. 1&2	902				2
1	-R75 SH. 1&2	902				2
1	-R76 SH. 1&2	902				2
1	-R81 SH. 1	902			TVA 350 NO. 47A427-220-B4	2
1	-R82 SH. 1&2	902				2
1	-R83 SH. 1,2&3	905		2-7-83		2
1	03B-1AFW-V90 SH. 1&2	903		1-31-83	TVA 350 NO. 47A427-204 B3	2
1	03B-1AFW-R84 SH. 1&2	903		2-28-83	TVA 350 NO. 47A427-220-B1	2
1	03B-1AFW-R52 SH. 1&2	902		2-28-83	TVA 350 NO. 47A427-221 B0	2
1	-R67 SH. 1&2	901		2-28-83		2
1	-R68 SH. 1&2	901				2
1	-R72 SH. 1&2	902				2
1	-R50 SH. 1	901		3-17-83		2
1	-R51 SH. 1&2	904				2
1	-R53 SH. 1&2	901				2
1	-R54 SH. 1	901		3-10-83		2
1	-R55 SH. 1&2	901				2
1	-V56 SH. 1&2	901				2
1	-V57 SH. 1&2	902				2
1	-V60 SH. 1&2	902				2
1	-R61 SH. 1&2	902				2
1	-R62 SH. 1	901				2
1	-V64 SH. 1&2	901				2
1	-R66 SH. 1&2	901				2
1	-V70 SH. 1	901				2
1	-V78 SH 1	902		3-7-83	TVA 350 47A427-220-B1	2
1	-R79 SH. 1	903			"	2
1	-V80 SH. 1	902			"	2
1	-R85 SH.	901		3-10-83	47A427-204 B3	2
1	03B-1AFW-R86 SH. 1	902	3-30-83	3-17-83	"	2

TVA 10975E (EN DES-7-79)

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ENGINEERING CHANGE NOTICE NO. 3192

DATA SHEET NO. 1

PAGE 1

AFFECTED UNIT	DRAWING OR SDI NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINK UPDATE DATA REV. NO.
1	038-1AFW-R87 SH. 1	902	3-30-83	2-28-83	REPLACE TVA PIPE SUPPORT DRAWINGS. TVA 10975E FOR 47A427-209-R2	2
1	-V88 SH. N2	901		3-10-83		2
1	-R89 SH 1	901		3-10-83		2
1	-R91 SH. 2	902		2-28-83		2
1	-R92 SH 1	902		3-17-83		2
1	-R94 SH. 1	904		3-18-83	VOID	2
1	-R213 SH 1	903		3-10-83		2
1	-R214 SH 1	902		3-10-83		2
1	-V215 SH N2	902		3-10-83		2
1	-R216 SH 1	902		3-10-83		2
1	-R217 SH. 1	903		↓		2
1	-V218 SH 1	904		↓		2
1	-R219 SH. 1	902		3-17-83		2
1	038-1AFW -V220 SH. N2	902		3-10-83		2
1	47A427-1-02 SH.	0		3-10-83	TVA PIPE SUPPORT DRAWINGS. ISO: 47W427-221 R2	2
1	-1-03 SH.	0		↓	"	2
1	-1-04 SH.	0		3-17-83	ISO: 47W427-209 R2	2
1	-1-05 SH.	0		↓	"	2
1	-1-06 SH.	0		↓	"	2
1	-1-07 SH.	0		3-10-83	"	2
1	-1-08 SH.	0		↓	"	2
1	-3-10 SH.	0		3-10-83	ISO: 47W427-209 R2	2
1	-3-11 SH.	0		3-17-83	"	2
1	-7-03 SH.	3		↓	ISO: 47W427-221 R2	2
1	-7-04 SH.	0		3-10-83	"	2
1	-7-05 SH.	0		↓	"	2
1	-8-01 SH.	0		3-10-83	"	2
1	-8-02 SH.	0		↓	"	2
1	-8-03 SH.	0		↓	"	2
1	-8-04 SH.	0		↓	"	2
1	-8-05 SH.	0		3-17-83	"	2
1	-8-06 SH.	0		↓	"	2
1	-8-07 SH.	0		3-10-83	"	2
1	-8-08 SH.	0		3-7-83	ISO: 47W427-220-R1	2
1	-8-09 SH.	0	↓	↓	"	2
1	47A427 -8-10 SH.	—	3-30-83	—	Deleted "	2

TVA 10975E (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 5199

DATA SHEET NO. 1

PAGE 5

AFFECTED UNIT	DRAWING OR SKI NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	47A427-8-12 SH.	0	3-30-83	3-7-83	TVA PIPE SUPPORT DRAWING	2
1	-8-13 SH.	0			"	2
1	-8-14. SH	0			"	2
1	-8-15 SH.	0			"	2
1	-8-16 SH.	0			"	2
~~1~~	~~-8-17 SH.~~				~~Deleted~~ "	~~2~~ 3
~~1~~	~~-8-18 SH.~~				~~Deleted~~ "	~~2~~ 3
1	-8-19 SH	0		3-7-83	"	2
1	-8-20 SH.	0			"	2
1	-8-21 SH.	0			"	2
1	-8-22 SH.	0			"	2
1	-8-23 SH.	0			"	2
1	-8-24 SH.	0			"	2
1	-8-25 SH.	0			"	2
1	-8-26 SH.	0			"	2
1	-8-27 SH.	0			"	2
1	-8-28 SH.	0		3-10-83	See 47W427-221-R1	2
1	-8-29 SH.	0		3-10-83	" "	2
1	47A427 -9-01 SH.	0		3-7-83	See 47W427-220-R1	2
1	47A427 - 1-09 SH.	0		3-10-83	See 47W427-221-R1	2
~~1~~	~~47A060 - 3-34 SH.~~				~~Deleted~~ " "	~~2~~ 3
1	47A060 - 3-35 SH.	0	3-30-83	4-5-83	See 47W427-220-R1	2
1	47A427 - 7-06 SH.	0	3-30-83	3-10-83	" -221-R1	2
1	47A427 - 7-07 SH.	0	3-30-83	↓	" -221 R1	2
1	03B-1AFW-V73	901	3-30-83	3-17-83	"	2
1	03B-1AFW-R91 SH-1	902	3-30-83	3-10-83	ADDED SUPPORT NO.	3
1	47A060-3-36	0	3-30-83	4/5-83	ADDED SUPPORT NO.	3
1	47A427-1-10 SH	0	3-30-83	3-17-83	ADDED SUPPORT NO.	3
1	47A427-7-08 SH	0	3-30-83	3-17-83	ADDED SUPPORT NO.	3
1	47A427-1-02A	0		3-10-83	" "	3
1	47A427-1-03A	0			" "	3
1	47A427-8-28A	0	3-30-83	↓	" "	3
1	47A427-7-3A	0		3-18-83	" "	
1	47A427-1-04A	0	3-30-83	↓	"	

TVA 10670E (EN 0828-7-78)

TENNESSEE VALLEY AUTHORITY
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ENGINEERING CHANGE NOTICE NO. 3195

DATA SHEET NO. 1

PAGE

AFFECTED UNIT	DRAWING OR SDM NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UP ON DATA REV. NO.
1	47A427-1-05A	0	3-30-83	3-18-83	ADDED SUPPORT NO.	
1	47A427-1-10A	0	3-30-83	↓	" "	
1	03B-1AFW-R94 SH 2 of 2	901	3-30-83	3-18-83	VOID.	
1&2	8B402D	302		5-20-83	OIL PIPING SCHEMATIC	
	47W803-3	8			FLOW DIAG (AUX FW)	
	47W427-1H	2			HANGER LOCATION DWG	
	47W427-7	15			PIPING DRAWING	
	47W427-8	12			" "	
	47W427-9	1		↓	" "	
1	03B-1AFW-V220	903	9-30-83	1-9-84	N3-3-SA 47W427-204	
	47A427-3-11	1		↓		
	~~49A427-1-10~~			DELETE		
	47A427-7-06	1		1-9-84	47W427-221	
	~~03B-1AFW-R66~~			DELETE		
	-R061	903		1-9-84		
1	03B-1AFW-R219	903	1-30-84	1-24-84	N3-3-SA 47W427-204	
	~~UNIT 2 SUPPORTS FOR V80~~		1-84	Delete.		
1	03B-1AFW-V78	904	2-17-84	2-2-84	N3-3-SA 47W427-220	
	~~V80~~					
	-V80	904		2-2-84		
1&2	47W803-3	9	3-1-84	2-29-84		
1&2	47W427-9	3	3-1-84	2-29-84		
1	47B2627-3	2	4-15-84	4-12-84		
1	03B-1AFW-R061	204	4-19-84	4-17-84		

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3198
DATA SHEET NO. 2

DRAWN BY CEB
PAGE 1

To: Watts Bar Nuclear Plant, Spring City, Tn

From: Design Project Manager SWP 304 C-K
to: AUG 13 1982

Released By: [signature] Design Project Manager

Preparing Section: MECH. ENGR. # 5				
Prepared By: C.B. Collins MCS	RO	SWP 820813 502	R4	WBP 830808 510
Total Pages (RO): 2	R1	SWP 830301 537	R5	WBP 830928 528
Section Supervisor: J E McCord	R2	WBP 830510 506	R6	WBP 840427 558
Staff Eng. or Architect: [signature]	R3	WBP 830708 517	R7	
Group Head: W A English				
Branch Chief: R.O. Barnett 8/16/82 Date				

SCOPE

Project: Watts Bar Nuclear Plant — Affected Units: 1 & 2

System or Feature: Auxiliary Feedwater

Reference & Description of Change: Reanalysis of AFW System piping to consider additional piping and NCR ~~3775R~~ WBN 3755 R 4. JHR 3-1-83

CLOSED

DATE

CLOSURE SH. #

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
1	3-1-83	JHR	JEM	TC	ROB	HH	JCS	Revise Dates, Add Dwgs	2
2	5-10-83	JHR	JEM	TC	ROB	MK	JCS	Revise Dates, Add Dwgs.	2
3	7-8-83	JHR	JEM	TC	ROB	MK	JCS	Delete Dwgs	2
4	8-8-83	JHR	JEM	TC	ROB	MK	JCS	Add Dwg. est.	2
5	7-29-83	JHC	[illegible]	[illegible]	[illegible]	[illegible]	JCS	ADD DWG, Revise Dates	2
6	4-27-84	MDD	JEM	TC	ROB	MDD	JCS	Delete U2 Dwgs & Est U2 ECN 4786	3

...n. No. _____
Field Materials as follows:

Additional Information:

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, W8C126 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-10-79)

TENNESSEE VALLEY AUTHORITY
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ENGINEERING CHANGE NOTICE NO. 3498
DATA SHEET NO. 2

PAGE 2

AFFECTED UNIT	DRAWING OR S/H NUMBER	DWG REV.	ISSUE DATE EFFECTED	ISSUE DATE ACTUAL		REMARKS	LINE UNCHANGED ON DATA SHEET REV. NO.
1	47W427-204	32	4-30-83	2-24-83	N3-3-6A		2
1	47W427-220	18	4-30-83	2-24-83	N3-3-6A		0
2	47W427-203	2	4-30-83	Delete	N3-3-6A		6
2	47W427-221	0	4-30-83	2-24-83	N3-3-6A		0
1	47B427-386	0	4-30-83	Delete	N3-3-5A		3
1	385	0		Delete			3
1	386	0		Delete			3
1	387	04		2-24-83			0
1	388	04		2-24-83		N3-3-7A (VOID)	0
1	432	0		Delete			3
2	421	0	4-30-83	Delete	N3-3-6A		6
2	432	0		Delete			6
2	433	0		Delete			6
1	47B427-517	1	4-30-83	2-24-83		N3-3-5A	1
1	519	1					1
1	520	1					1
1	518	1					1
1	522	0					1
1	523	0					1
1	47B427-387	5	5-30-83	5-10-83		N3-3-5A	2
1	-517	2					2
1	-518	2					2
1	-519	2					2
1	-520	2					2
2	Unit 2 Test		12-30-83	Delete			6
1	47W427-221	1	10-27-83	10-3-83		N3-3-5A	5

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3198

Watts Bar Nuclear Plant, DATA SHEET NO. 3

BRANCH [illegible]

PAGE 1

To:

From: Design Project Manager SWP 204 C8-K

Released By: [signature] Design Project Manager

FEB 02 1983

Preparing Section: SWP WMG • 4	R0	SWT '83 0202 540	R4	
Prepared By: W.L. KEETON (1-28-83)				
Total Pages (R0): 2	R1		R5	
Section Supervisor: B. Campbell				
Staff Eng. or Architect: N/A	R2		R6	
Group Head: [signature]	R3		R7	
Branch Chief: Date				

SCOPE

Project: WATTS BAR NUCLEAR PLANT   Affected Units: 1 & 2

System or Feature: SLEEVES AND SEALS FOR AUXILIARY FEEDWATER SYS.

Reference & Description of Change: NCR 3755 R1 REVISE VARIOUS AFW PIPING TO SPECIFY CODE CLASS AND VENDOR PACKAGE BOUNDRIES AND REANALIZE CODE PIPING.

REVISE SLEEVE AND SLEEVE SEAL DRAWINGS TO ACCOMMODATE PIPING CHANGES.

CLOSED

DATE

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES

No. NO PR

Materials as follows: NONE

Additional Information: None

CHIEF, COST PLANNING AND CONTROL STAFF, [illegible] C-K
CHIEF, ARCHITECTURAL SUPPORT BRANCH, [illegible] C-K
CHIEF, CIVIL ENGINEERING BRANCH, [illegible] C-K
CHIEF, ELECTRICAL ENGINEERING BRANCH, [illegible] C-K
CHIEF, SPECIAL DESIGN PROJECTS, [illegible] C-K

PLANT SUPERINTENDENT
CONSTRUCTION PROJECT MANAGER
[illegible], [illegible] C-K
[illegible], [illegible] CST2-C

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2198
DATA SHEET NO. 3

PAGE 2

AFFECTED UNIT	DRAWING OR SYS NUMBER	DRWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	CONCURRENCE OR DATE (INITIAL)
1 & 2	47W471-3	22	5-16-83	4-6-83	CHG PK 49 TO PK 89	
1 & 2	47W471-18	29	5-16-83		REV SEAL TAB	
1 & 2	47W478-1	11	5-16-83	↓	REV SEAL TAB	

[redacted]

[redacted]

SCOPE OF CHANGE ESTIMATE

WATTS BAR NUCLEAR PLANT ECN NO. 3198

BUILDING AUXILIARY

SYSTEM/FEATURE: SLEEVES & SEALS FOR AFW PIPING

☒ Revisions by this section will not require additional material

☐ Revisions by this section will require additional materials as listed below

Item	Unit 1 Qty	Unit 2 Qty	Procured By (EN DES/CONST)	PR, Reqn, or Contr	Requested Delivery Date	Remarks

W. L. Keeton
Preparer

[signature] 1/25
Section Supervisor

TVA 10875C (EN DES-10-79)

ENGINEERING CHANGE NOTICE COVER SHEET

SWP 820127 516

(BEFORE ISSUANCE OF OPERATING LICENSE)

This ECN has been accepted to Delete Unit 2 work released as of 4-20-89. Remaining unit 2 work will be implemented under ECN 4787. PAB

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ECN NO. 3210

To: Construction Project Manager Watts Bar Nuclear Plant, Spring City, TN

From: Design Project Manager SWP 204 GB-K 840604B0009

DATE JAN 21 1982

WAS IT Awards Required yes ___ no ___

W B Harris	WMG #2	J Rumbley
Prepared by	Section	Section Leader
J C Clay	Released: R W Cantrell	1-25-82
Project Engineer	Design Project Manager	Date

SCOPE

Project Watts Bar N.P. Affected Unit(s) 1 & 2

System or Feature Aux Feedwater NCR WBN CEB 8116

Reference & Description of Change Full Thermal Moment re-evaluation for AFW pump Suction & Discharge piping. Drawings will be revised as a result of the re-evaluation (NCR WBN CEB 8116, WBN 1 & 2)

DRAWINGS OR B/M'S INVOLVED: (Data Sheets Required)	Yes or No	Date Branch Data Sheet Approved
Thermal Power Engineering Branch		
Civil		
Electrical		
Mechanical	No	
Nuclear		
Thermal Power Engineering Des Project		
Civil		
Electrical	No	
Mech	WMG-2 Yes	
Arch, Hydro, & Spec Proj Eng & Des		
Arch	No	
Civil	No	
Electrical	No	
Mech	No	

CLOSED DAW 5-21-84 CLOSURE SH. # 13

Other Approving Branches	Yes or No
ECN Approval Required	Yes
Approved for branch review:	
Design Project Manager	1-14-82 Date
Approved: R.O.S.	
TPE Civil Br. Chief	11-10-81 Date
NA	
TPE Electrical Br. Chief	Date
NA	
TPE Mechanical Br. Chief	Date
NA	
Chief Nuclear Engineer	Date

WBP 840521 533

	Yes or No
Required for PSAR or FSAR	No
Required for Preoperational Test:	No
Vendor Backcharges Involved	No
Seismic Analysis Required	Yes
Nonconformance Report Required	Yes
QA Applies	Yes
Vendor(s) involved: Misc.	

PHYSICAL WORK MUST BE DONE BEFORE:

	Pre-Op Test	1st Fuel Load	1% Therm Power	Comm'l Oper'n	1st Refuel	
Unit(s) 1		✓				
Unit(s) 2		✓				

CC (Attachments): No (Yes)

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, W8C126 C-K
Chief, Electrical Engineering & Design Branch, W2D224 C-K
MEDS, E4B37 C-K
Chief Nuclear Engineer, W10C126 C-K
Chief, Mechanical Engineering Branch
Chief, Mechanical Engineering
Chief, Quality Engineering
Manager
Chief

IMPACT JUSTIFICATION ANALYSIS

IJ/ECN NO. 2210
IJ NO. _____
DCR NO. _____

PART 1 (COMPLETED BY LEAD ENGINEER OF INITIATING BRANCH/PROJECT)

PROJECT WBNP PROJECT CODE 85- ACCT NO. NI-255-20

1. REASON FOR ANALYSIS:
   - [x] A. NRC/OTHER MANDATED REGULATORY REQUIREMENTS
   - [ ] B. DESIGN IMPROVEMENTS/CRITERIA CHANGES
   - [ ] C. REQUESTS FROM OTHER TVA DIVISIONS
   - [ ] D. CONTRACTOR/SUPPLIER ACTION
   - [ ] E. SIGNIFICANT ENGINEERING ERRORS
   - [ ] F. PREOP TEST DEFICIENCY
   - [ ] G. OTHER

2. DESCRIBE: REVISE DWGS AS REQ'D BY REANALYSIS FOR NCR WBN CEB 8116.

3. TIME FRAME FOR IMPLEMENTATION:
   - (A) IMMEDIATE - ESSENTIAL FOR UNIT OPERATION OR SAFETY.
   - B. AFFECTS OPERATING RELIABILITY/AVAILABILITY. IMPLEMENT BY _____ (DATE)
   - C. IMPROVES OPERATING EFFICIENCY, FLEXIBILITY, OR CONVENIENCE. MAY BE DEFERRED.

INITIATING BRANCH/PROJECT

W. B. HARRIS JR.	LEAD ENGINEER	1/14/82 DATE
[signature]	SUPERVISOR	1/14/82 DATE
[signature]	GROUP HEAD/PROJECT ENGINEER	1/14/82 DATE
[signature]	BRANCH CHIEF	1/18/82 DATE

4. EN DES EP 1.18 COST ESTIMATE ATTACHED [ ] YES [ ] NO

PART 2 (COMPLETED BY COST ENGINEER PROJECT/PROGRAM OR LEAD BRANCH)

5. POTENTIAL SCHEDULE IMPACT TO CONST/POWER: (POTENTIAL IMPACT ITEM NO. _____)
   NONE

6. DOES CHANGE AFFECT MAJOR SCHEDULE MILESTONE OR ACTIVITY ON CRITICAL PATH OF PLANT SCHEDULE? [ ] YES [x] NO IF YES, LIST EFFECT: _____

7. AGREED TO BY CONST/POWER? [ ] YES [ ] NO N/A CONST/POWER SIGNATURE

8. [x] APPROVED [ ] DISAPPROVED [ ] DEFERRED [ ] MORE INFORMATION IS REQUIRED

[signature] 1/18/82
PROJECT MANAGER/LEAD BRANCH CHIEF DATE

A DESIGN & PROCUREMENT SCHEDULE

IJ/ECN NO. 1210
IJ NO. _____
DCR NO. _____

NO.	ACTIVITY DESCRIPTION	DUR. WEEKS	START DATE	198[illegible] J F M A M J J A S O N D	198[illegible] J F M A M J J A S O N D
1	REANALYSIS OF AFW & FW SYS	14	1-Dec-8[illegible]		
2	REVISE DWGS PER REANALYSIS	14	1-Dec-8[illegible]		

ORGANIZATION _____ DATE _____

LJ/ECN No. 3210
IJ No. _____
DCR No. _____

PART 3-B EN DES MAN-HOURS

Design and Procurement (D&P) Costs (preliminary estimates)

Activity	Organization	Man-hours	No. of Dwgs.
~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~
Revise Dwgs	Stress	150	Later

TOTAL 150

Organization _____ Date _____

PART 3-C EN DES COST SUMMARY

Average Cost Per MH 20.90 X Total Man-Hours 150 = Total EN DES Labor Cost $3135

Contracts 1300 MHS (Gilbert) 49,400

Miscellaneous Direct Costs 10% 315

Indirect Expense 40% 21,140

Contingency 15% (220 MHS) 11,010 PKM 1/14/82

Total Design & Procurement Cost $85,000

Escalation (Esc) Factor ____ X Total D&P Cost ____ = Total Esc D&P Cost ____

Lead Engineer W. B. HARRIS Jr.

[redacted] [redacted]

PART 4A CONSTRUCTION OR IMPLEMENTATION SCHEDULE

IJ/ECN NO. 3210
IJ NO. ________
DCR NO. ________

NO.	ACTIVITY DESCRIPTION	DUR. WEEKS	START DATE	198_												198_											
				J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
	NO CONST. WORK																										
	REQ D																										

IJ/ECN NO. 3210

IJ NO. ________

DCN NO. ________

PART 4B - ESTIMATE OF TOTAL T & L DIRECT MANPOWER REQUIREMENTS

TASK CODES *		ESTIMATED QUANTITIES	UNIT OF MEASURE	STD. CRAFT SPLIT (a)	% MANPOWER DISTRIBUTION BY CRAFT CODE (b)										ADJ. UNIT RATE	TOTAL T & L MANHOURS	WEIGHT AVG. HR. RATE (c)	TOTAL T & L DIRECT COST
DESCRIPTION	CODE				01	02	03	04	05	06	08	09	11	20				
				(✓)														

	TOTAL T & L MANHOURS	WEIGHT AVG. HR. RATE (c)	TOTAL T & L DIRECT COST
SUBTOTALS:			$
INCREMENTAL OVERTIME ADJUSTMENT ____ %			$
TOTAL T&L DIRECT MANPOWER REQUIREMENT (d)			$

* - MUST BE COMPATIBLE WITH CONSTRUCTION'S UNIFORM TASK CODE SYSTEM

(a) ✓ IF CONSTRUCTION STANDARD CRAFT SPLIT

(b) SPECIFY CRAFT SPLIT IF NOT COMPATIBLE WITH CONSTRUCTION'S STANDARD CRAFT SPLIT.

(c) WEIGHTED AVERAGE HOUR RATE IS IN DOLLARS PER MANHOUR.

(d) TOTAL COST BASED ON CONSTRUCTION MIDPOINT IN FY 19__.

________ ESTIMATOR ________ DATE

IJ/ECN NO. 7210
IJ NO. _____
DCR NO. _____

PART 4C - MATERIAL & EQUIPMENT COSTS (VALUES ARE CONCEPTUAL ESTIMATES)

Material Description	Est Qty	Unit Cost	Est Cost	Approx Date Req'd
NO MAT'L REQ'D				

TOTAL COST $0

ESCALATION FACTOR _____

TOTAL ESCALATION COST: _____

W. B. HARRIS, JR. 1-14-82
Estimator Date

[redacted]

[redacted]

EN DES-M 4.40
Attachment No. 1
Page 7 of 7
LJ/ECN NO. 7210
LJ NO. _____
DCR NO. _____

PART 5 - TOTAL OEDC COST SUMMARY

(project)

(description)

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

1
TOTAL OEDC COST BASED ON MIDPOINT CONSTRUCTION IN FY 19__, EXCLUDES OTHER TVA ORGANIZATIONS AND INTEREST.

CEB '81 1014 002 NONCONFORMANCE REPORT [1] Attachment 2 REPORT NO. WBNCEB811

[2] PROJECT SUP [3] PLANT WBN [4] UNIT All

PREPARER/ORGANIZATION/DATE W. L. Smathers/LPE-CEB-HAS/10-7-81

DESCRIPTION OF CONDITION

The FSAR, section 10.4.9.2, defines a thermal range for the auxiliary feedwater system 40° F to 120° F. The ASME code, section NC-3651, for classes 2 and 3 piping systems, requires that the full range of moments be evaluated per equation 10. The full thermal range from 40° F to 120° F was not evaluated for suction and discharge piping for the auxiliary feedwater pumps by the piping stress analyst. This condition may result in unconservative stress levels.

DATE OF OCCURRENCE EST (X), ACT. ( ) 1979

METHOD OF DISCOVERY FSAR review

UN.D CODE (EN DES-EP 8.01)

SCHEDULE IMPACT [ ] P [ ] A [ ] N

[11] SCN REQUIRED [X] YES [ ] NO

[12] SIGNIFICANT CONDITION ADVERSE TO QUALITY YES [X] NO [ ]

[13] *BRANCH CHIEF/DATE 10/13/81

CORRECTIVE ACTION:

ASSIGNABLE CAUSE: (REQUIRED IF SIGNIFICANT)

ACTION REQUIRED TO PREVENT RECURRENCE: (REQUIRED IF SIGNIFICANT)

*QA ENGINEER REVIEW AND CONCURRENCE:

LABOR EST. ( ), ACT. ( ) MH [19] SCHEDULE EST. ( ), ACT. ( ) DA

ACTIVITY NO. [21] TASK DESCRIPTION [22] DATE INITIATED

REMARKS:

DISTRIBUTION:
- EB QA GROUP-ENGINEERING SECTION
- OC QA
- B-NLS (For Significant NCR's)** WK 10/14/81
- AEDS
- NSRS (For Significant NCR's) JJR
- JCW 10/14/81

DISTRIBUTE AFTER THIS SIGNATURE
MAILROOM COPY TO WEB-NLS ALSO

[24] ALL ACTION COMPLETE: BRANCH CHIEF/ORG. DATE

[25] *NCR CLOSED: CHIEF, QUALITY ENGINEERING BRANCH DATE

QEB USE

0 7 5 9

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3210
DATA SHEET NO. 1

BRANCH [illegible]
PAGE 1

To: _____

NPD Project Manager _____ Released By: _____ NPD Project Manager

RD SWP 8201275/7

Preparing Section	MEDI Accession No.	MEDI Accession No.
Prepared By: _____ Date	WBP '840427 562	
Total Pages (ROI):		
Section Supervisor: JJN		
Staff Eng. or Architect:		
Group Head: AS		
Br. Chief/ SDP Mgr.:		

SCOPE

Project _____ Affected Units _____

System or Feature _____

Reference & Description of Change _____

CLOSED

DATE _____

CLOSURE SH. # _____

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
8	4-7-84	MK	JJN	AS	[illegible]	MK	[illegible]	Delete unit 2 est.	10

o. _____

Field Materials as follows:

Additional Information:

TVA 10575A (EN DES-2-83)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. ________
DATA SHEET NO. ________

PAGE

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	[illegible]

0761

TENNESSEE VALLEY AUTHORITY
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DATA SHEET NO. 1

BRANCH SWP
SHEET 2

Watts Bar Nuclear Plant, Spring City, TN

To:

From: Design Project Manager SWP 204 C-K
JAN 27 1982

Released By: [signature] Design Project Manager

ing Section

Prepared By:	J.L. PURKEY
Total Pages (RO):	3
Section Supervisor:	[signature]
Staff Eng. or Architect:	NA
Group Head:	[signature]
Branch Chief:	Date

	MEDS Accession No.		MEDS Accession No.
R0	SWP '82 0127 517	R4	WBP '83 0628 510
R1	SWP '82 0630 548	R5	WBP '83 0815 522
R2	WBP '83 0425 516	R6	WBP '83 0823 518
R3		R7	WBP '83 1031 522

SCOPE

Project WATTS BAR N.P Affected Units 1&2

System or Feature AUX Feedwater Revise drawings for

Reference & Description of Change FULL Thermal movement re-evaluation

For AFW pump suction and discharge piping.

NCR WBUCEB 811C (SI 1014 0D2)

DATE

CLOSURE SH. #

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PREPARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
1	6-30-82	LMC	[illegible]	[illegible]	N/A	CE	JCS/K	ADDED DWGS.	4
2	9-8-82	LMC	[illegible]	[illegible]	N/A	CE	JCS/K	ADDED DWGS	8
3	4-25-83	DWO	JWN/K	JCH/K	NH	MJD	JCS/K	ADDED DWGS (DWGS HAVE BEEN ISSUED PER SCN BUT NOT REFLECTED ON LISTED DWGS)	8
4	6-28-83	DWO	[illegible]	[illegible]		MK	JCS/K	CORRECTED DWG NOS 1-832-990 TO 1-832-989 ON SHT 6	8
5	8-15-83	RLI	[illegible]	[illegible]		MJD	JCS/K	ADDED 2 UNIT 1 SUPPORTS & UNIT 2 ESTIMATE	8
								Removed U2 Later Comment On P.8	9
6	9-23-83	RLI	[illegible]	[illegible]	N/A	MK	JCS/K	ADDED UNIT 2 SUPPORT DWGS	
	10-31-83	RLI	[illegible]	[illegible]	N/A	MK	JCS/K	DELETED UNIT 1 SUPPORT DWG NO.	9

. No. N/A

d Materials as follows:

Additional Information: NO PL's

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

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DATA SHEET NO. 1

PAGE 1

AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UP ON DATA REV.	
1	1-03A-442	901	~~7-30-82~~ 11-30-82	9-17-82	Load change	02-08	1
1	443	902	~~7-30-82~~ 11-30-82	9-17-82	New strut required		1
1	447	903	~~7-30-82~~ 11-30-82	9-16-82	Strut changed to spring	0207	1
1	453	903	~~7-30-82~~ 11-30-82	3-15-82	Load change	0207	1
1	455	903			" "		1
1	466	902			" "		1
1	469	901			" "	0207	1
	480	901			Redesign	02-08	1
	481	901			Change Spring		1
	484	901	~~7-30-82~~		Load change		1
	~~486~~				" "		
	488	901	~~7-30-82~~		Drawing "		1
	489	902			Load "		1
	491	901			Steel " MEMBER ADDED		1
	493	902			Drawing "		
1	497	903			Snubber "		
	505	902			~~Load~~ * DESIGN CHANGE		
	506	901			~~DESIGN~~ ROAD CHANGE	02-08	1
	490	902	~~7-30-82~~		Load "	02-08	1
1	1-03A-407	1	7-30-82	3-31-82	NO CONST WORK	02-06	1
	408	2					
	409	2					
	411	1			CONSTRUCTION REQUIRED		
	416	1			CONSTRUCTION REQUIRED		
	418	3					
	422	2					
	1-03A-423	901		4-15-82	NO CONST WORK		
	47A401-8-1	0	11-30-82	3-31-82	New Support		2
1	47A401-6-1	0	~~11-30-82~~	3-31-82	New Support	02-06	2
1	1-03A-494	902	3-12-82	3-15-82	LOAD CHANGE	02-08	
1	1-03A-499	903	3-12-82	↓	LOAD CHANGE	02-08	
1	1-03A-486	904	7-30-82	9-13-82		02-08	1

TVA 10878E (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3210

DATA SHEET NO. 1

PAGE 9

AFFECTED UNIT	DRAWING OR S/N NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	1-03A-365	902	~~2-14-82~~	3-15-82	Load change 02-05	1
1	-369	902			Load & Mvmt change.	
1	-370	901			"	
1	1-03A-372	902			Load change.	
1	-374	902			Load & Mvmt change	
1	-375	901			Revised & Redesigned.	
1	-376	901			Revised & Redesigned	1
1	1-03A-377	901	~~3-11-82~~		Load & Mvmt change 02-05	
1	03B-1AFW-R095	904		6-24-82	LOAD REVISED Page # 12A	2
	-R096	901			LOC. CHANGE	
	-R097	901			LOAD CHANGED CONST. WORK REQ'D.	
	-R100	902			LOC. CHANGE	
	-R99	901			LOAD CHANGE	
	-R107	901			PAD CHANGE	10A
	-R109	901			LOAD CHANGE CONST. WORK REQ'D	
	47A060-3-3	3			LOAD CHANGE	
	-3-4	1				
	-3-6	2				12A
	-3-7	2				
	03B-1AFW-R103	901				
	-R104	903			CONST. WORK REQ'D	10A
	-R105	901			LOC. CHANGE	
2	03B-2AFW-R95	901	9-30-82	6-18-82	LOAD CHANGE	19A
	-R97	901		6-13-82	CONST. WORK REQ'D	
	-R99	901		6-13-82	LOAD CHANGE	
	-R101	901		6-13-82	CONST. WORK. REQ'D	
	-R103	901		6-18-82	LOAD CHANGE	
	-47A060-3-30	1	9-30-82	6-18-82	LOAD CHANGE	
	03B-2AFW-R107	901	9-30-82	6-18-82	LOAD CHANGE	17A
	-R109	901		6-18-82		
	-R110	901		6-13-82		
	-R111	901	9-30-82	6-18-82		

TVA 10575E (EN DES-7-79)

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PAGE 6

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE NO. ON DAT. REV. NO.
2	47A060-3-31	0	9-30-82	6-18-82	NEW SUPPORTS N3-3-174	1
	-32	0			"	
	-33	0			"	
	-33A	0	9-30-82		"	
1	03B-1AFW-R5	901	12-15-82	9-17-82	CONST. WORK REQ. LOAD CHANGE PROB. N3-3-M & 5A	2
	-R2	903			LOAD CHANGE CONST. WORK REQ.	
	-R6	901			LOAD CHANGE CONST. WORK REQ.	
	-R7	901		9-17-82	LOAD CHANGE	
	-R8	905		9-17-82	DWG. VOIDED CONST. WORK REQ.	
	-R9	904		8-25-82	LOAD CHANGE	
	-R10	902		8-25-82	LOAD CHANGE	
	-R11	901		8-25-82	LOAD CHANGE	
	-R12	901		9-17-82	LOAD CHANGE CONST. WORK REQ.	
	-R14	903		9-17-82	DWG VOIDED CONST. WORK REQ.	
	-R15	903		8-25-82	LOAD CHANGE	
	-R16	903		9-17-82	DWG VOIDED CONST. WORK REQ.	
	-R17	905			LOAD CHANGE	
	-R18	902		9-17-82	LOAD CHANGE CONST. WORK REQ.	
	-R19	901		8-25-82	LOAD CHANGE	
	-R20	901		9-17-82	LOAD CHANGE	
	-R25	903		8-25-82	LOAD CHANGE	
	-R28	903		9-17-82	LOAD CHANGE	
	-R29	902			LOAD CHANGE	
	-R31	902			LOAD CHANGE	
	-R35	901		9-17-82	DWG. VOIDED CONST. WORK REQ.	
	-R121	904			DIM. CHG & LOAD CHG CONST. WORK REQ. N3-3-4A	
	-R137	902			LOCATION & CHG. CONST. WORK REQ. N3-3-4A	
	-R3	902		9-16-82	LOAD CHG. — CONST. WORK REQ. N3-3-M &	
	-R32	903		9-16-82	LOAD CHG. N3-3-M &	
	-R34	901		9-17-82	DWG VOIDED CONST. WORK REQ. N3-3-M & 2A	
	-V13	901		9-17-82	DWG VOIDED CONST. WORK REQ. N3-3-M & 2A	
	03B-1AFW-V21	901			DWG VOIDED CONST. WORK REQ. N3-3-M & 2A	

TVA 10875E (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3210

DATA SHEET NO. 1

ED	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
						08-02
1	1-03A-400	902	12-15-82	9-25-82	LOAD CHG.	2
	-401	902		9-25-82	LOAD CHG.	
	-402	902		8-25-82	LOAD & LOCATION CHG.	
	-403	904		8-25-82	LOAD CHG.	
	-404	903		9-17-82	DWG. VOIDED CONST. WORK ROAD	
	-405	903		8-25-82	LOAD CHG. CONST. WORK ROAD	
	-413	901		8-25-82	LOAD CHG.	
	-414	901		8-25-82	LOAD CHG.	
	-415	903		9-17-82	LOAD CHG.	
	1-03A-406	902		9-16-82	LOAD CHG. CONST. WORK ROAD	
1	1-03B-51	901	12-15-82	9-16-82	DWG. VOIDED CONST. WORK ROAD	05-02 2
	-52	901			DWG. VOIDED CONST. WORK ROAD	
	-53	904			LOAD CHG CONST. WORK ROAD REDESIGNED, RETAINED	
	-54	901			DWG. VOIDED CONST. WORK ROAD	
	-55	901			LOAD CHG.	
	-56	903				
	-57	901				
	-58	903				
	-59	904				
	-60	903				
	-61	901				
	-62	903				
	-63	903				
	-64	903				
	-65	903				
	-66	903				
	-67	903				
	-68	903				
	-69	903				
	-70	901			DWG. VOIDED CONST. WORK ROAD	
	-71	903		9-17-82	LOAD CHG.	
	-72	901			DWG VOIDED CONST. WORK ROAD	
	-73	903			LOAD CHG. CONST. WORK ROAD	
	1-03B-74	901			DWG VOIDED CONST. WORK ROAD	

TVA 10575E (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3210

DATA SHEET NO. ____

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	REV
1	1-03B-75	901	12-15-82	9-17-82	DWG. VOIDED CONST. WORK REQD	
	-76	901		9-17-82	DWG. VOIDED CONST. WORK REQD	
	-77	901		9-17-82	DWG. VOIDED CONST. WORK REQD	
	-78	903		8-25-82	LOAD CHG	
	-79	903		9-17-82		
	-80	905		9-16-82		
	-81	903		8-25-82		
	-82	904		9-16-82		
	1-03B-83	902		9-17-82		
1	47A427-2-31	R0	12-15-82	9-17-82	NEW SUPPORT CONST. WORK REQD NB-3-1413A	2
1	47A427-6-1	R0	12-15-82	9-16-82	NEW SUPPORT CONST. WORK REQD	6

TVA 10575E (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3210

DATA SHEET NO. 1

PAGE 8

ED	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UP/ON DAT REV. R	
	1-03B-1	901	12-10-82	9-16-82	CONST. WORK REQ'D	02-01	2
	-2	901			~~VOID DWG~~ CONST. WORK REQ'D.		
	-3	903			CONST. WORK REQ'D		
	-4	901			~~VOID DWG~~ CONST. WORK REQ'D.		
	-5	903			LOAD CHANGE		
	-6	903			DOCUMENT CHANGE		
	-7	903			LOAD CHANGE		
	-8	904					
	-9	903					
	-10	903					
	-11	903			CONST. WORK REQ'D.		
	-12				LOAD CHANGE		
	-13						
	-14						
	-15						
	-16						
	-17						
	-18						
	-19						
	-20						
	-21						
	-22						
	-23						
	-24	901			~~DWG IS VOIDED~~ CONST. WORK REQ'D		
	-25	905			LOAD CHANGE		
	-26	901			~~DWG IS VOIDED~~ CONST. WORK REQ'D		
	-27	905			LOAD CHANGE		
	-28	901			~~DWG IS VOIDED~~ CONST. WORK REQ'D		
	-29						
	-30						
	-31						
	-32						
	-33						
	-34	902			DOCUMENT CHANGE ONLY LOAD CHANGE ONLY		
	-35	902			MOUNT CHANGE		
	1-03B-37	901			LOAD CHANGE		

TVA 10979E (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3210

DATA SHEET NO. 1

PAGE 9 OF 15

AFFECTED UNIT	DRAWING OR BOM NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LNW DW RE
1	1-038-39	902	12-15-82	9-17-82	CONST. WORK REQ'D.	
	1-03A-440 (DWG 4-27-83)	903			LOAD CHANGE	
	-441	903				
	-442	901				
	-443	902				
	-444	904				
	-445	903				
	-446	904			CONST. WORK REQ'D	
	-447	903			CONST. WORK REQ'D.	
	-449	902			LOAD CHANGE.	
	-450	903			CONST. WORK REQ'D	
	-451	905			SUPPORT DELETED. CONST. WORK REQ'D	
	-452	902			DOCUMENT CHANGE	
	-453	904				
	-454	903				
	-455	904			CONST. WORK. REQ'D	
	-456	903			LOAD CHANGE	
	-457	901				
	-458	902				
	~~1-03A-459~~ (DWG 4-27-83)	902		9-17-82		
	1-03A-468	901			PROB # 82-07	
	(DWG 4-27-83) -470	904				
	1-03A-471	903				
1	47A401-8-1A (DWG 4-27-83)	0	11-30-82	3-31-82	(NOW SUPPLEMENT) CONST. WORK REQ'D PROB 82-06	3
	47A427-6-1A (DWG 4-27-83)	0		9-16-82		
	47A427-6-1B (DWG 4-27-83)	0		9-16-82		
2	~~REMAINDER OF UNIT 2 HGRS WILL BE IDENTIFIED LATER~~ DW 8/13/83					5 5 5
1	1-03A-360	903	9-30-83	9-23-83	PROB 82-05 ISOMETRIC 47W401-212	
~~1~~	~~038 TAFW VEC~~	~~1~~	~~1~~	~~1~~	~~1~~ DWG 82-205	7
	~~ESTIMATE 150 UNIT 2 SUPPORT DWGS~~				~~3-30-84 DELETE~~	5

TVA 10870E (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 5210

DATA SHEET NO. 1

PAGE 9

ECTED UNIT	DRAWING OR SM NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED IN DATA SHEET REV. NO.
2	2-03B-11	901	8-30-83	9-20-83	03-01 ~~DWG~~ 47W467-218 (R0)	6
	-61	901	↓	↓	03-01 ~~DWG~~ 47W467-219 (R1)	6

TVA 10075E (EN DES-7-75)

ENGINEERING CHANGE NOTICE NO. 8210

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 1

PAGE [illegible]

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE		REMARKS	LINE UP ON DATA REV. NO.
			EXPECTED	ACTUAL		

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3210
DATA SHEET NO. 2

BRANCH WBP
PAGE 1

To: _____

In: NPD Project Manager _____ Released By: _____ NPD Project Manager

NO SWP 92 0127 518

Preparing Section		
Prepared By: _____ Date	EAP	WBP '831216 535
Total Pages (RO):	EAP	
Section Supervisor: McCord	EAP	
Staff Eng. or Architect:	EAP	
Group Head:	EAP	
Br. Chief/ OP Mgr.:	EAP	

NPDB Accession No. | NPDB Accession No.

SCOPE

Project WATTS BAR NUCLEAR PLANT Affected Units 1 & 2

System or Feature AUX. FEEDWATER & FEEDWATER SYSTEM

Reference & Description of Change _____

CLOSED

DATE _____

CLOSURE SH. # _____

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
7	12/6-93	JRC	[illegible]	[illegible]	[illegible]	MKD	JESD	DELETE U2 EST.	4

TO: _____

Field Materials as follows:

Additional Information:

TVA 10675A (EN DES-2-83)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. ______
DATA SHEET NO. ______

PAGE [ ]

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL		REMARKS	LINE NO. ON DATA SHEET REV.

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 8210
DATA SHEET NO. 2

BRANCH CEB
PAGE 1

To: Watts Bar Nuclear Plant, Spring City, TN

Design Project Manager: WB 304 C8-K

Released By: [signature] Design Project Manager

JAN 27 1982

Preparing Section	Mech. Anal. #5
Prepared By:	C. O. Collins 2762
Total Pages (RO):	3
Section Supervisor:	[signature]
Staff Eng. or Architect:	[signature]
Group Head:	W A English
Branch Chief:	R. O. Bahnsen 1-10-81 Date

	MEDS Accession No.	MEDS Accession No.
RO	SWP '82 0127 518	SWP '83 0121 534
R1	SWP '82 0312 524	WBP '830808 511
R2	SWP '82 0831 518	WBP '831008 502
R3	SWP '82 1005 514	

SCOPE

Project: WATTS BAR NUCLEAR PLANT — Affected Units: 1 & 2

System or Feature: Aux. Feedwater & Feedwater System

Reference & Description of Change: Reanalysis of AFW & FW Systems to consider the Full Temperature Range. "NCR B116"

CLOSED

DATE

CLOSURE SH. #

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PREPARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
~~A~~		~~BRL~~	~~VDL~~	~~WAE~~	~~ROB~~			~~ADDED DRAWINGS ON PAGE 3~~	~~3~~
1	3-12-82	RTR	VDL	WAE	ROB	LGP	MRA	ADDED DRAWINGS ON PAGE 4	4
2	8-31-82	MAB	JEM	WAE	ROB	CE	JCS	ADD DWGS & CHANGE DATES	4
3	10-5-82	MAB	JEM	TR	ROB	CE	JCS	ADD DWGS	4
4	1-21-83	THR	JEM	TC	ROB	AD	JCS	Delete all dwgs	4
5	8-8-83	JHR	JEM	TC	ROB	MK	JCS	Add Dwg. est.	4
6	10-8-83	JMC	[illegible]	[illegible]	/	MKC	JCS	ADD DATE	4

No. _____

Field Materials as follows:

Additional Information:

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. 9210
DATA SHEET NO. 2

PAGE 2

AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL		REMARKS	LINE ON DA REV.	T
1	47W427-203	3 4	8-15-82	3-3-82	Discharge	N3-3-10A, 12A		2
	47B427-362	2		3-3-82		Support Dwg.		
	363	2		3-3-82		↓		
	375	4		3-3-82		Anchor Dwg.		
	376	2		↓				
	378	4						
	379	2		3-3-82				
↓	481	1		3-3-82		↓		
2	47W427-205	HH X5		7-28-82	Suction	N3-3-1A, 2A, 9A		
	47W427-206	HH X4		7-28-82		↓		
	47B427-351	2		7-28-82		Support Dwg.		
	352	2		↓		↓		
	353	2						
	354	2						
	355	2						
	356	2						
	389	2		7-28-82				
	390	2						
	391	2				↓		
	401	2				Anchor Dwg.		
	402	2		7-28-82		↓		
	~~434~~			HH	Delete			4
	~~435~~				Delete			4
	~~436~~				Delete			4
	~~437~~				Delete			4
	~~438~~				Delete			4
	~~439~~				Delete			4
	~~440~~				Delete			4
	~~441~~				Delete			4
	478	1		7-28-82				
↓	479	1		7-28-82		↓		
2	47W427-211	2		3-17-82	Discharge	N3-3-17A, 19A		
	47B427-418	1		3-17-82		Support Dwg.		
	419	1		3-17-82		↓		
	420	2		3-17-82		Anchor Dwg.		
↓	421	1	↓	3-17-82		↓		

TVA 10875E (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3210

DATA SHEET NO. 2

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
2	47B427-422	3	2-15-82	3-19-82	N3-3-17A,19A Analog Comp. Diesel	
↓	423	1	↓	2-19-82	↓	
1&2	0600200-05-01	001		2-17-82	SG # 3 Discharge	
	~~" 05-02~~	~~4~~	~~11-30-82~~	Delete	" 2	428
	0600200-02-05	1		1-28-82	" 1	
	" 02-06	1		2-19-82	" 2	
	" 02-07	2		1-28-82	" 3	
↓	" 02-08	2	↓	2-19-82	" 4	
1&2	47W401-214	0	1-10-82	1-28-82	0600200-02-07	
	47B401-414	0		1-28-82		
	-415	0		1-28-82		
	~~-416~~		~~11-30-82~~	Delete		428
↓	-422	0	↓	1-28-82	↓	
2	47W401-213	0	1-10-82	2-19-82	0600200-02-06	
	47B401-411	0		2-19-82		
	-412	0		2-19-82		
	-413	0		2-19-82		
↓	-423	0	↓	2-19-82	↓	
1&2	47W401-212	0	1-10-82	1-28-82	0600200-02-05	
	47B401-408	0				
	-409	0				
	-410	0				
	-421	0				
	47B427-468	1				
	-470	1				
↓	-475	1	↓	↓	↓	
1&2	47W401-215	0	1-10-82	2-19-82	0600200-02-08	
	47B401-417	0		2-19-82		
	-418	0		2-19-82		
	-419	0		2-19-82		
	-420	0		2-19-82		
↓	~~47B427-397~~		~~11-30-82~~	Delete	↓	430

TVA 10875E (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3210

SHEET NO. 2

PAGE 4

AFFECTED UNIT	DRAWING OR BOM NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE ON DWG REV. NO.
1	47B427-508	0	7-5-82	8-3-82	N3-3-10A	2
1	47B427-509	0	7-5-82	↓	N3-3-12A	2
2	47B427-510	0	7-15-82	7-19-82	N3-3-10A	2
2	47B427-511	0	7-15-82	↓	N3-3-12A	2
1+2	47B427-512	0	4-1-82	7-28-82	N3-3-1A, 2A	2
1+2	47B427-513	0	4-1-82	7-28-82	N3-3-1A, 2A	2
1	47B427-514	0	4-1-82	7-28-82	N3-3-9A	2
1	-515	0	4-1-82	7-28-82	↓	2
1	-516	0	4-1-82	7-28-82	↓	2
1+2	47W427-218	0	8-5-82	9-24-82	05-01	2
	47B427-504	0	↓	↓	↓	2
	-505	0				2
	-506	0				2
↓	-507	0	↓	↓	↓	2
1+2	47W427-219	0	8-5-82	8-10-82	05-02	2
	47B427-500	0	↓	↓	↓	2
	-501	0				2
	-502	0				2
↓	-503	0	↓	↓	↓	2
~~1+2~~	~~47W401-213~~		~~8-30-82~~ 8-25-82	Delete		4
	47B401-422	1	—	9-24-82		3
	[redacted]					
	47B427-521	0	—	9-24-82		3
	47W401-216	0	—	9-24-82		3
~~2~~	~~Unit 2 30 cst.~~		~~12-30-82~~	DELETE per NCN-82		7

TVA 10878C (EN DES-10-81)

ENGINEERING CHANGE NOTICE
COVER SHEET

SWP '82 0407 517

(BEFORE ISSUANCE OF OPERATING LICENSE)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ECN NO. 3306

To: Construction Project Manager ~~Watts Bar Nuclear Plant, Spring City, TN~~

From: Design Project Manager ~~SWP 204 C8-K~~

DATE APR 07 1982

8304174A0193

(11)

Was IJ Analysis Required: Yes ____ No X

J.L. BUSHNELL — Prepared by
SWP-ES — Section
Section Leader

G.D. Collins — Project Engineer
Released: W.B. Rankin — Design Project Manager
4-2-82 — Date

SCOPE

Project WATTS BAR NUCLEAR PLANT — Affected Unit(s) 1 & 2

System or Feature W. W2 SWITCH MODIFICATION

Reference & Description of Change REVISE DWG's TO IMPLEMENT THE CHANGES OUTLINED W NRC BULLENTIN 80-20 AND SQ-DCR-837.

DRAWINGS OR B/M'S INVOLVED: (Data Sheets Required)	Yes or No	Date Branch Data Sheet Available
Thermal Power Engineering Branches		
Civil	N	
Electrical	A	
Mechanic		
Nuclear	NO	
Thermal Power Engineering Branches Project		
Civil	NO	
Electrical E2, E5	YES	ATTACHED
Mech	NO	
Analysis	NO	
Arch, Hydro, & Spec Proj Eng & Des		
Arch	NO	
Civil	NO	
Electrical	NO	
Mech	NO	

CLOSED
DATE 3-30-82

Thermal Power Engineering Branches Approval Required	Yes or No
	YES
ECN is ready for TPE branch review: Design Project Manager for R.W. Tiller — Date	3-23-82
Approved:	
TPE Civil Br. Chief N/A — Date	
TPE Electrical Br. Chief F.W. Chandler for — Date	3-30-82
TPE Mechanical Br. Chief N/A — Date	
Chief Nuclear Engineer A.A. Wilder for — Date	3-30-82

SWP 83 0303 569

PHYSICAL WORK MUST BE DONE BEFORE:	Pre-Op Test	1st Fuel Load	1% Therm. Power	Comm'l Oper'n	1st Refuel	
Unit(s) 1		✓				
Unit(s) 2		✓				

	Yes or No
~~Required for PSAR or FSAR~~	NO
Required for Preoperational Test:	NO
If Yes, Test No.	
Vendor Backcharges Involved	YES
Seismic Analysis Required	NO
Nonconformance Report Required	NO
QA Applies	YES
Security System Modified	NO
Vendor(s) involved:	WESTINGHOUSE

CC (Attachments): ~~NO~~ Yes (1 & 2)
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, W6C126 C-K
Chief, Eelctrical Engineering & Design Branch, W2D224 C-K
MEDS, 100 UB-K
Chief, Nuclear Engineer, W10C126 C-K
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, E7B24 C-K
Chief, Cost Planning and Control Staff, W12C74 C-K
Plant Superintendent

1304

TVA 64 (08-9-80)

UNITED STATES GOVERNMENT

Memorandum

Attachment 1 sheet 1 of 6

DES 8008210 39

TENNESSEE VALLEY AUTHORITY

L36800820945

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

FROM : 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 6823
WPT
9-2-80

Category

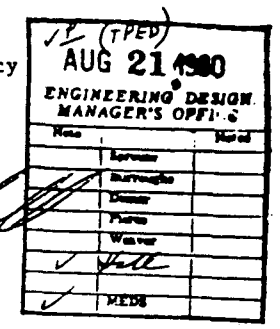
A (X) NRC commitment, nuclear safety, or EPA requirement

B ( ) Availability, capacity, and reliability improvement

C ( ) ALARA and safety (industrial)

D ( ) Improved maintenance and operational efficiency

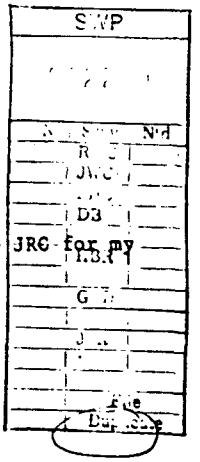
E ( ) Convenience item



J. R. Calhoun

TGC:JR:DEM:BEA
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 JRG for my signature.--MNS
G. F. Dilworth, W10C126 C-K
MEDS, E2237 C-K



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

1305

SQHP
AI-19 - Part III
ATTACHMENT 6
Page 1 of 1
Rev. 3

AH 1
Sheet 2 of 6

DESIGN CHANGE REQUEST

Sequoyah Nuclear Plant DCR No. SQ-DCR-~~1~~ 850 1/20/80 - 837 Date 8/18/80

Originating Section E. Maint Originator Mark Brock

Outstanding Work Item No. 1 - 317 - 8224
Unit System Sequence

Component W-2 Switches

Change Requested: Redesign the control circuits to monitor the neutral contacts on all W-2 spring-return-to-center type switches or change to GE SBM switches. Place priority on the sixty switches listed on the attached list.

Reason for Request: To comply with I.E. Bulletin 80-20

Non-safety-related DCR	Safety-related DCR
1. CSSC non-safety related ____	1. CSSC safety-related X
2. Non-CSSC and does not directly affect safety-related CSSC ____	2. Non-CSSC but directly affects safety-related CSSC ____
3. Work can be completed prior to offsite approval ____	3. Tech spec changes involved ____ section ____
Non-safety-related review completed by ____	

* Accounting Data

☐ Preliminary EN DES scoping work to be done under Job Order No. ____

☐ This modification is to be capitalized under ____

☐ This modification is to be charged to Maintenance Account No. ____

N/A / ____
Outage Section Admin. Officer Date

☐ This is a non-safety-related modification, a safety review has been performed, and approval is given to begin modification.

____ / ____
Plant Superintendent Date

Work completed; transmit to EN DES for drawing revision only.

____ / ____
Outage Director Date

☐ This modification is safety related or is to be transmitted to EN DES for processing.

Approved for transmittal to Chief, NUC PR C. S. Cantrell for / 8/19/80
Plant Superintendent Date

Approved for transmittal to EN DES. Jesse S. Clayton for / 8/20/80
Director of Nuclear Power Date

*Only filled out if under consideration after

50-[illegible]

AH 1 sheet 3 of 6

COST ESTIMATE

	UNIT 1	UNIT 0	TOTAL
LABOR	1000.00	$ 400.00	1400.00
MATERIAL	16000.00	2000.00	18000.00
FIELD ENGINEERING	3000.00	500.00	3500.00
DESIGN ENGINEERING	15000.00	2000.00	17000.00
TOTAL	$35000.00	8500.00	$43500.00

Alternative Considered: NRC Commitment no alternative

Cost Benefit Analysis: NRC commitment no analysis

AH 1 Sheet 4 of 6

Switch	Contact Development Drawing Sheet No.	Drawing	Schematic Drawing No.
HS-1-4A	219	1643-3,9	601-5,6,7
1-HS-1-11A	84	1643-4	601-7
1-HS-1-23A	84	1643-4	601-7
1-HS-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	1648-5	779-3
80A	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
21A-6A	213	1648-3	779-21
10A	213	1648-3	779-21
108A	168	1648-3	779-21
109A	168	1648-5	779-21

50-DCR-P-237
AH 1 sheet 5 of 6

Switch	Contact Development Drawing Sheet No.	Drawing	Schematic No.
31C-303A	253	1648-3	779-32
338A	253	1648-5	779-32
S7-46A	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
444A	142	1660-7	765-15
452A	142	1660-7	765-15

1709

SQ-OCR-P-337
Att 1 sheet 6 of 16

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	146	1660-11	779-2,5
2-HS-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

[redacted] [redacted]

Enclosure 2 (SSINS No. 6820)

SSINS No.: 6820
Accession No.:
8006190023

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

July 31, 1980

IE Bulletin No. 80-20

FAILURES OF WESTINGHOUSE TYPE W-2 SPRING-RETURN TO NEUTRAL CONTROL SWITCHES

By letter dated June 18, 1980, Commonwealth Edison Company 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.

Subsequent tests conducted on the malfunctioning switch revealed that contact closure was intermittent with the switch in the neutral (or "Auto Start") position. Other tests conducted on identical switches from spares and from Unit 2 equipment disclosed two additional switches with a tendency for intermittent contact closure.

A review of this matter by Westinghouse led to the issuance of NSD Technical Bulletin No. NSD-TB-80-9 to the utility owners 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.

Depending on how the indicating light circuit is wired, loss of continuity thru the neutral 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:

1. 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

switches and the total number of switches so used. If no such switches are used in your facility, you should indicate that this is the case and ignore the remaining questions.

2. 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.

3. Licensees of operating plants and holders of construction permits shall describe the longer 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 1 provided the light is readily visible to the control room operator. If not, failures of the neutral position contacts should be annunciated in the control room.

A report 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. Approval was given under a blanket clearance specifically for identified generic problems.

Enclosure:
Figure 1

[redacted] [redacted]

Nuclear Service Division

Technical Bulletin

Announcement/notice of a recent technical development pertaining to the installation or operation of Westinghouse supplied Nuclear Plant equipment. Recipients should evaluate the information and recommendation, and initiate action where appropriate.

P.O. Box 2728 Pittsburgh PA 15230

Subject
W-2 Switches (with spring return to neutral)

System(s)
Electrical Control

Affected Plants
All Sites

References
NSD TB-73-26, & initial issue of this bulletin, dated 7/15/80

Number
NSD TB 80-9 (Rev. 1)

Date
7/16/81

S.O.(s)
285

Sheet 01
1 2

BACKGROUND INFORMATION

During monthly operational testing of the safeguards system at an operating nuclear plant, intermittent W-2 switch operation was discovered in the neutral (auto) position. Investigations 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 matter was reported to the Nuclear Regulatory Commission on June 18, 1980. At the same time, the initial issue of this Bulletin presented preliminary Westinghouse recommendatic

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 mechanism exists. This conclusion has been confirmed by independent tests at the W Research 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 minimum requirements recommended by NRC Bulletin 80-20 of July 31, 1980.

RECOMMENDED ACTION

1. All plants should test all safety-related contacts of the W-2 switches (with spring return to neutral position) in the neutral position.

2. These tests should be repeated following each subsequent use (removal from the neutral position) of the switch, and should be done either at normal operating voltage at the contacts, or at least 24 VDC.

Additional information, if Required, may be Obtained from the Originator Telephone 412 256-5493 or (WIN) 236-5493

Originator
W. H. Furfari
Electric Service

Approval
J. R. Terry, Manager
Electric Service

Service Division

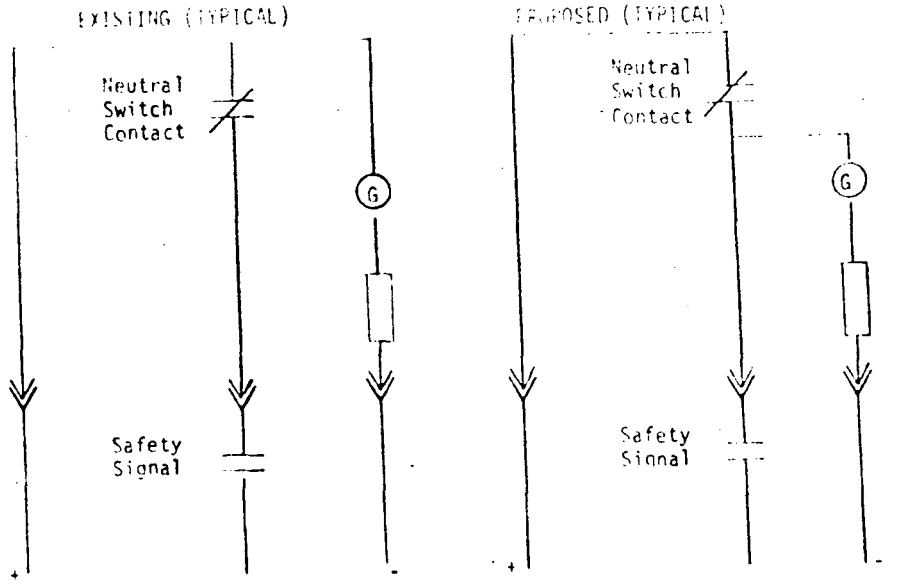
Technical Bulletin

An advisory notice of a recent technical development pertaining to the installation or operation of Westinghouse supplied Nuclear Plant Equipment. Recipients should evaluate the information and recommendation, and initiate action where appropriate.

P.O. Box 355 Pittsburgh, PA 15230

NSD-TB-80-9 (Rev. 1) -2- 2/18/81

As an alternative to these periodic tests, a permanent resolution of any tendencies to intermittent contact continuity is to wire the existing breaker green light indicator in series with the neutral position safety-related switch contacts (See Sketch). In those instances where no indicating lights exist, a lamp drawing a minimum of 30 milliamperes D.C. should be added. This current provides for breakdown of contact film contaminants (fritting) so that no safety circuit relaying on contact continuity can fall into a degraded condition. Green light indication will now confirm closure of the safety-related switch contacts, and this indication should be checked after each switch operation.



ENGINEERING CHANGE NOTICE
COVER SHEET

PROJECT MGR. 4/22/83 DATE

SWP 83 0214 505

(BEFORE ISSUANCE OF OPERATING LICENSE)
This ECN has been rescoped to delete unit 2 work unassigned as of 9-26-89. Remaining unit 2 work will be implemented under FCN 4795 4-24-89 MB

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ECN NO. 3507

To: Construction Project Manager Watts Bar Nuclear Plant, Spring City, TN

From: Design Project Manager SWP 204 GB-K 8405200 1193 (12)

DATE FEB 14 1983

Budget Item: 221

Was IJ Analysis Required: Yes ____ No ✓

J.T. BAXTER — Prepared by
SWP-WMG-2 — Section
J.J. Moak 12/15/82 — Section Leader
J.C. Key 1/20/83 — Project Engineer
Released: — Design Project Manager
2/7/83 — Date

SCOPE

TRANSFER PKG: X-003(2).

Project WATTS BAR NUCLEAR PLANT — Affected Unit(s) 1 & 2

System or Feature MAIN & AUX. FEEDWATER SYS 3A & 3B; SEC. CHEMICAL FEED SYS 3A.

Reference & Description of Change REMOVE SEC. CHEM. FEED CONNECTIONS FROM MAIN FW, FW BYPASS, AND AUX. FEEDWATER LINES. TIE SEC. CHEM. FEED TO STEAM GEN. WET LAYUP RECIRCULATION LINES ADDED BY ECN 3375. REF. MEMO GREEN TO SPROUSE (DES 82 1203 020).

DRAWINGS OR B/M'S INVOLVED: (Data Sheets Required)	Yes or No	Date Branch Data Sheet Available
ENGINEERING SUPPORT BRANCHES		
Civil PAS2	YES	
Electrical	NO	
Mechanical	NO	5-21-84
Nuclear	NO	
NUCLEAR PROJECTS DESIGN GROUPS		
Civil	NO	
Electrical	NO	
Mech 2, 4.	YES	
FOSSIL, HYDRO & SPECIAL PROJECTS DESIGN		
SPECIAL DESIGN PROJECTS	NO	
ARCHITECTURAL SUPPORT BRANCH	NO	

CLOSED
DATE
CLOSURE SH. # 131

ENGINEERING SUPPORT BRANCHES	Yes or No
[illegible]	YES
Design is [illegible] Branch review: [illegible] Design Project Manager	1-14-83 Date
Approved: R.A. Barnett, [illegible] CHIEF	2/1/83 Date
NA JTB, [illegible] ELECTRICAL BR. CHIEF	Date
J.P. Doyle for CAC, [illegible] MECHANICAL BR. CHIEF	1-26-83 Date
J.A. Wilder for, [illegible] Nuclear Engineer	2-3-83 Date
WBP 840521 541	

	Yes or No
Required for PSAR or FSAR	No
Required for Preoperational Test:	No
If Yes, Test No.	**
Vendor Backcharges Involved	No
Seismic Analysis Required	YES
Nonconformance Report Required	No *
QA Applies	YES
Security System Modified	No
Vendor(s) involved:	No
WBP 840427 [illegible]	

PHYSICAL WORK MUST BE DONE BEFORE:

	Pre-Op Test	1st Fuel Load	1st Therm Power	Comm'l Oper'n	1st Refuel	
Unit(s) 1 & 2		✓				
Unit(s)						

CC (Attachments): Yes (|)

CHIEF, ARCHITECTURAL SUPPORT BRANCH, WBC12B C-K
CHIEF, CIVIL ENGINEERING BRANCH, WBC22B C-K
CHIEF, ELECTRICAL ENGINEERING BRANCH, WBC12B C-K
CHIEF, MECHANICAL ENGINEERING BRANCH, WBC12B C-K
CHIEF, NUCLEAR ENGINEER, WBC12B C-K
CHIEF, QUALITY ASSURANCE BRANCH, E100 WHB-K

* CHANGE DUE TO NRC CRITERIA CHANGE.
** Testing required
CHIEF, COST PLANNING AND CONTROL STAFF, WBC12B C-K
CHIEF, SPECIAL DESIGN PROJECTS, WBC22B C-K
MANAGER OF CONSTRUCTION, E7B26 C-K
PLANT SUPERINTENDENT
NRDB, WBB3 C-K

TVA (O-ICS-0.43)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

SWP '82 1222 174

ECN NO 3507
ATTACHMENT 1
SHEET 1 OF 2

TO : 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 10CFR50 Appendix A.

M. N. Sprouse

JCS:JTB:CSB
cc: J. P. Darling, 546 CST2-C
MEDS, WSB63 C-K
H. H. Mull, E7B24 C-K
R. M. Pierce, 104 ESTA-K
J. C. Standifer, 204 GB-K
G. Wadewitz, Watts Bar Nuclear CONST (3)

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

Memorandum

TO : H. N. Sprouse, [illegible]

FROM : H. J. Green, Director of Nuclear Power, [illegible] CST2-C

DATE : December 2, 1982

SUBJECT: WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - CONTAINMENT ISOLATION - SECONDARY CHEMICAL FEED LINES

(DES 821122 008) /B

DEC 3 '82

ENGINEERING DESIGN MANAGEMENT OFFICE

Reference: My memorandum to you dated September 21, [illegible]

The referenced memorandum discussed [illegible] recommendations to meet GDC [illegible] of 10 CFR 50 appendix A for the [illegible] chemical feed [illegible]. Since that memorandum was sent, the decision [illegible] made to resolve this problem through the new steam generator preservation 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 chemical feed lines will then be connected to the steam generator layup recirculation system. This modification has been discussed with John Baxter [illegible].

SUP

H. J. Green

[illegible]
cc: [illegible] CST2-C
W. T. Cottle, NUC PR, Watts Bar

#36
12-13-82

This was prepared principally by R. L. Erickson.

[illegible]

12/3/82 - DBB:SB
cc: MEDS, W5B63 C-K
R. M. Pierce, 10th ESTA-K
J. C. Standifer, 20th GB-K - Please handle.—MHS

ECN NO. 3507
ATTACHMENT 1
SHEET 2 OF 2

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3507
DATA SHEET NO. 1

BRANCH SWP
PAGE 1

To: Watts Bar Nuclear Plant, Spring City, TN

From: Design Project Manager SWP 201 C-K

Released By: J C Kay Lane for Design Project Manager

FEB 14 1983

Preparing Section	SWP MMS-2
Prepared By:	JOHN T BAXTER
Total Pages (RQ):	2
Section Supervisor:	12/15/82
Staff Eng. Architect:	N/A
Group Head:	J C Kay Lane
Branch Chief:	N/A Date

	Work Authorization No.	Work Authorization No.
CO	SWP 830214 506	WBP 831110 504
1	WBP 830419 524	WBP 840427 602
2	WBP 830505 510	
3	WBP 830815 531	
4		
5		
6		
7		

SCOPE

Project: WATTS BAR NUCLEAR PLANT — Affected Units: 1 & 2

System or Feature: MAIN & AUX. FEEDWATER - SYS 3A & 3B ; SEC. CHEM. FEED - SYS 36.

Reference & Description of Change: REMOVE SEC. CHEM. FEED CONNECTIONS FROM MAIN FW, FW BYPASS, AND AUX. FW LINES. TIE SEC CHEM FEED TO STM. GEN. WET LAYUP RECIRCULATION LINES ADDED BY ECN 3375.

CLOSED

DATE

CLOSURE SH. #

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV NO.	DATE ISSUED	PREPARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
1	4-19-83	DPS			N/A	MK		ADDED 47N401-6	2
2	5-5-83				N/A			ADDED HGR DWGS TO BE VOIDED	2
3	5-15-83	RLE			N/A			ADDED UNIT 1&2 HANGER DWGS	2
4	11-8-83				N/A	MK		DELETED SUPPORTS REANALYZED AND ISSUED PER ECN 3408	2
5	4-27-84	MB			N/A	MB		Deleted U2 DWGS U2 ECN 4795	3

P- No.

Materials as follows:

Additional information:

CHIEF, COST PLANNING AND CONTROL STAFF, W12C78 C-K
CHIEF, ARCHITECTURAL SUPPORT BRANCH, W9C126 C-K
CHIEF, CIVIL ENGINEERING BRANCH, W9D220 C-K
CHIEF, ELECTRICAL ENGINEERING BRANCH, W9C126 C-K
CHIEF, SPECIAL DESIGN PROJECTS, W9D220 C-K

PLANT SUPERINTENDENT
CONSTRUCTION PROJECT MANAGER
NEDB, W10B63 C-K
ADMS, E40 C57C-C

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3807
DATA SHEET NO. 1

AFFECTED UNIT	DRAWING OR SVS NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE DELETE - ON DATA SHEET REV. NO.
1&2	47W809-1	24	~~5-13-83~~ ~~5-10-83~~	4-12-83		
	47W809-2	18		4-12-83		
	47W401-1	16		4-14-83		
	-2	17				
	-7	10				
	47W401-9	9		4-14-83		
	47W427-5	7				
	47W427-6	7	3-10-83			
	47W401-6	10	4-15-83			
1	~~1-053A-542~~	~~2~~	7-29-83		Ordered by Mech Analysis	4
	~~1-053A-548~~	~~1~~			DWGS WILL BE REVISED	4
	~~1-053A-549~~	~~1~~			TO VOID	4
	~~1-053A-550~~	~~2~~				4
	~~1-053A-551~~	~~3~~			THESE SUPPORTS ISSUED	4
	~~1-053A-552~~	~~1~~			VOID PER REANALYSIS	4
	~~1-053A-553~~	~~1~~			UNDER ECN 3608	4
	~~1-053A-568~~	~~2~~			DELETE FROM DATA	4
	~~1-053A-570~~	~~2~~			SHEET	4
	~~1-053A-571~~	~~1~~				4
	~~1-053A-572~~	~~1~~				4
~~1&2~~	~~ADDITIONAL SUPPORTS~~		~~5-13-83~~	Deleted		
	~~OVER~~		9-29-83	Deleted	PROBLEM ISOMETRIC	3
1	~~1-034-540~~				02-10 49A401-422	3
	~~541~~				REANALYZED; ISSUED	4
	~~543~~				PER ECN 3608 DELETE	4
	~~49A401-9-2~~				FROM DATA SHEET	4
	~~49A401-9-3~~					4
2	~~2-034-540~~		~~5-13-83~~ 9-29-83			5
	~~541~~					5
	~~543~~					5
	ESTIMATE 12 ADDITIONAL UNIT 2 SUPPORT DWGS ~~#1 5-1-84~~					5

[redacted] [redacted]

ESTIMATE

UNIT NO. 3507

BUILDING AUXILIARY AND REACTOR

SYSTEM/FEATURE: FEEDWATER, AUX. FEEDWATER, SEC. CHEM. FEED

☒ Revisions by this section will not require additional material

☐ Revisions by this section will require additional material as listed below

Item	Unit 1 Qty	Unit 2 Qty	Procured By (EN DES/CONST)	PR, Reqn, or Contr	Requested Delivery Date	Remarks

J.T. Baxter
Preparer

J.J. Nash
Section Supervisor

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3507
DATA SHEET NO. 2

Watts Bar Nuclear Plant, Spring City, TN

BRANCH SWP
PAGE 1

To:

From: Design Project Manager SWP 204 C-K

Released By: Design Project Manager

FEB 14 1989

Planning Section: SWP WM6 #4	6	SWP '83 0214 507
Prepared By: HOWARD HARVEY 02-8-0	5	SWP '88 0412 517
Total Pages (NCR): 2	4	WBP '830510 501
Section Supervision:	3	
Staff Eng. or Architect:		
Group Head:		
Branch Chief: Date		

SCOPE

Project: WATTS BAR NUCLEAR PLANT — Affected Units: 1&2

System or Feature: SECONDARY CHEMICAL FEED - SYSTEM (36)

Reference & Description of Change: REMOVE SECONDARY CHEMICAL FEED SYSTEM (36) CONNECTIONS FROM MAIN FEEDWATER, FEEDWATER BYPASS, AND AUXILIARY FEEDWATER LINES. TIE SECONDARY CHEMICAL FEEDWATER TO STEAM GENERATOR WET LAYUP RECIRCULATION LINES.

CLOSED

DATE

CLOSURE CM-2

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PREPARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. SUPV.	DESCRIPTION OF REVISION	TOTAL PAGES
1	4-12-23	GRH	BMD	[illegible]	N/A	MK	JCS	DELETE 47W471-10 & -11 ADD 47W470-2 & -10	2
"	—	—	—	—	—	—	—	ADD 47W471-2, -3, -18, -24 AND 47W472-1 & -9	
2	5/10 83	HLH	BMD	[illegible]	N/A	MK	JCS	DELETE 47BM495-3 ADD 47W495-1 & 47W495-2	2

No. ~~AR & V-3587~~ HLH

Materials as follows:

Additional Information: None

None

CHIEF, COST PLANNING AND CONTROL STAFF, W12C70 C-K
CHIEF, ARCHITECTURAL SUPPORT BRANCH, W9C130 C-K
CHIEF, CIVIL ENGINEERING BRANCH, W9C830 C-K
CHIEF, ELECTRICAL ENGINEERING BRANCH, W9C130 C-K
CHIEF, SPECIAL DESIGN PROJECTS, W9B24 C-K

PLANT SUPERINTENDENT
CONSTRUCTION PROJECT MANAGER
MGR., WBNP C-K
ADMR., 640 LOTB-K

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2507
DATA SHEET NO. 2

PAGE 2

AFFECTED UNIT	DRAWING OR SKD NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE IDENTICAL ON DATA SHEET REV. #
1,2	47W 495-3	4	3/18/83	3-10-83		
	47W 854-1	9		3-21-83		
	[redacted]			DELETE		1
	[redacted]			DELETE		1
	47W 495-9			DELETE		2
1&2	47W470-2	12	[illegible]	4-8-83	REVISE SLV	1
1&2	47W470-10	7	4/8/83	↓	REVISE SLV SEAL	1
1&2	47W471-2	21	7-1-83	4-28-83	REVISE SLV	1
1&2	47W471-3	23	↑	↑	REVISE SLV	1
1&2	47W471-18	30			REVISE SLV TAB	1
1&2	47W471-24	3			REVISE SLV TAB	1
1&2	47W472-1	12			REVISE SLV SEAL	1
1&2	47W472-9	3	7-1-83	↓	REVISE SLV SEAL	1
1,2	47W495-2	7	5-20-83	5-10-83		2
1,2	47W495-1	9	5-20-83	↓		2

NO. 3507

BUILDING TURBINE BLDG

SYSTEM/FEATURE: SYS 36 / SECONDARY CHEM. FEED

☐ Revisions by this section will not require additional material

☒ Revisions by this section will require additional materials as listed below

Item	Unit 1 Qty	Unit 2 Qty	Procured By (EN DES/CONST)	PR, Reqn, or Contr	Requested Delivery Date	Remarks
½" CARBON STEEL TUBING	50 FT	50 FT	EN DES	PR# V-3507		

Howard L Harvey
Preparer

B D Campbell 12/8
Section Supervisor

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3507
DATA SHEET NO. 3

BRANCH C653

PAGE 1

Watts Bar Nuclear Plant, Spring City, Tn

To:

From: Design Project Manager SWP 204 GBK

Released By: J C Kay Jr
Design Project Manager

FEB 14 1983

Preparing Section	TPE C653 - PASE
Prepared By:	Michael S Bradley
Total Pages (RO):	02
Section Supervisor:	J. E McCord
Staff Eng. or Architect:	
Group Head:	Jane Engineer
Branch Chief:	R. O. Barnett, 12-8-82 Date

	Initiating Authorization No.	Implementing Authorization No.
0	SWP '83 0214 508	WBP '831008 506
1	WBP '830607 511	WBP '831216 536
2	WBP '830722 502	
3	WBP '830808 521	

SCOPE

Project: WATTS BAR NUCLEAR PLANT — Affected Units: 1 & 2

System or Feature: MAIN & AUX FEEDWATER (03) SEC. CHEMICAL FEED (31a)

Reference & Description of Change: REMOVE SEC. CHEMICAL FEED CONNECTIONS FROM MAIN FEEDWATER, FEEDWATER BYPASS, AND AUX FEEDWATER LINES. TIE SEC. CHEMICAL FEED CONNECTIONS [redacted] TO STEAM GENERATOR WET LAYUP RECIRCULATION LINES ADDED BY ECN 3375

CLOSED

DATE

CLOSURE SH. #

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV NO.	DATE ISSUED	PREPARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
1	1-7-83	JNR	JEM	TC	ROB	MK	[illegible]	Add Dwg. Revise Dates	2
2	7-22-83	JNR	JEM	TC	ROB	MK	[illegible]	Delete Dwgs	2
3	8-8-83	JNR	JEM	TC	ROB	MK	[illegible]	Add dwg. est.	2
4	10-5-83	JMC	[illegible]	[illegible]	[illegible]	MK	JKS	ADD DATE	2
5	12-6-83	JRC	[illegible]	TC	[illegible]	MK	JKS	DELETE U2 EST.	2

Re: [illegible]

F[illegible]terials as follows:

Additional Information:

CHIEF, COST PLANNING AND CONTROL STAFF, W12C70 C-K
CHIEF, ARCHITECTURAL SUPPORT BRANCH, W9C120 C-K
CHIEF, CIVIL ENGINEERING BRANCH, W9B220 C-K
CHIEF, ELECTRICAL ENGINEERING BRANCH, W9C130 C-K
CHIEF, SPECIAL DESIGN PROJECTS, W12B220 C-K

PLANT SUPERINTENDENT
CONSTRUCTION PROJECT MANAGER
NSRS, W12B3 C-K
ADMS, 640 CST2-C

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3507
DATA SHEET NO. 2

PAGE 2

AFFECTED UNIT	DRAWING OR SYS NUMBER	ENG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATE'S ON DATA SHEET REV. NO.
1&2	47W427 - 207	6	~~89-9-30~~	7-22-83	N3-3-13A, 14A	0
1	47W401-422	0	6-30-83	6-9-83	02-10	1
	~~D6002200-02-10~~	~~904~~		Delete	(VOID)	2
	47B401-426	1		6-8-83		
	↓ -427	1		↓	↓	
	47W401-421	0		↓	02-11	
	~~D6002200-02-11~~	~~904~~		Delete	(VOID)	2
	47B401-428	1		6-8-83		
	↓ 429	1	↓	↓	↓	
~~2~~	~~Unit 2 sht 5~~		~~12-30-84~~	DELETE per N3-3		5

SCOPE OF CHANGE ESTIMATE

WATTS BAR NUCLEAR PLANT ECN NO. 3507

BUILDING AUXILIARY & REACTOR

SYSTEM/FEATURE: FEEDWATER, AUX. FEEDWATER, SEC. CHEM. FEED

[X] Revisions by this section will not require additional material

[ ] Revisions by this section will require additional materials as listed below

Item	Unit 1 Qty	Unit 2 Qty	Procured By (EN DES/CONST)	PR, Reqn, or Contr	Requested Delivery Date	Remarks

Preparer

J. E. McCord
Section Supervisor By with

ENGINEERING CHANGE NOTICE
COVER SHEET SWP '83 0314 506

(BEFORE ISSUANCE OF OPERATING LICENSE)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ECN NO. 3511

To: Construction Project Manager Watts Bar Nuclear Plant, Spring City, TN

From: Design Project Manager SWP 204 GB-K 8404068U218 (34)

DATE MAR 14 1983 Budget Item: 211

Was IJ Analysis Required: Yes ____ No ✓

G.L. PENNINGTON — Prepared by — Project Engineer — 1/16/1

SWP WMG-2 — Section

J.J. Nash — Section Leader

Released: J.C. Stanley — Design Project Manager — 3/9/83 — Date

SCOPE

Project WATTS BAR NUCLEAR PLANT Affected Unit(s) 1

System or Feature AUXILIARY FEEDWATER - SYS 38. (NCR WBN SWP 8301, WBN SWP 8568, WBN SWP 8272, WBN SWP 8569)

Reference & Description of Change ENDES CHANGES, EXCEPT ELECTRICAL, DUE TO BLACK AND VEATCH INDEPENDENT REVIEW FINDINGS. REF NEB 82 1006 220 (ATTACH 1)

DRAWINGS OR B/M'S INVOLVED: (Data Sheets Required)	Yes or No	Date Branch Data Sheet Available
ENGINEERING SUPPORT BRANCHES		
Civil	YES	
Electrical	No	
Mechanical	No	
Nuclear	No	
NUCLEAR PROJECTS DESIGN GROUPS		
Civil 1,2	YES	
Electrical 4	No	
Mech 2	No	
FOSSIL, HYDRO & SPECIAL PROJECTS DESIGN		
SPECIAL DESIGN PROJECTS	No	
ARCHITECTURAL SUPPORT BRANCH	No	

CLOSED
DATE 3-21-84
CLOSURE SH. 133

WBP '84 0321 527

ENGINEERING SUPPORT BRANCHES	Yes or No
Approval Required	YES
ECN is ready for ✓ branch review: D.S. Tolan for Design Project Manager — Date	2-9-83
Approved: R.O. Barnett — CEB CIVIL BR. CHIEF — Date	2/23/83
NA/mm — CEB ELECTRICAL BR. CHIEF — Date	
M Davidson for — CEB MECHANICAL BR. CHIEF — Date	2-28-83
[illegible] for — CEB Nuclear Engineer — Date	3-7-83

	Yes or No
Required for SAR or FSAR	No YES 3-7-83
Required for Preoperational Test:	Yes No 3-7-83
If Yes, Test No.	FSAR
Vendor Backcharges Involved	No
Seismic Analysis Required	YES
Noncor..ormance Report Required	Yes
QA Applies	YES
Security System Modified	No
Vendor(s) involved:	No

PHYSICAL WORK MUST BE DONE BEFORE:

	Pre-Op Test	1st Fuel Load	1% Therm Power	Comm'l Oper'n	1st Refuel	
Unit(s) 1		✓				
Unit(s)						

CC (Attachments): No - Yes (5)

CHIEF, ARCHITECTURAL SUPPORT BRANCH, W6C126 C-K
CHIEF, CIVIL ENGINEERING BRANCH, W9B229 C-K
CHIEF, ELECTRICAL ENGINEERING BRANCH, W9C126 C-K
CHIEF, MECHANICAL ENGINEERING BRANCH, W7C126 C-K
CHIEF, NUCLEAR ENGINEER, W10C126 C-K
CHIEF, QUALITY ASSURANCE BRANCH, 5100 W18-K

CHIEF, COST PLANNING AND CONTROL STAFF, W12C70 C-K
CHIEF, SPECIAL DESIGN PROJECTS, W28B29 C-K
MANAGER OF CONSTRUCTION, CTE8A C-K
PLANT SUPERINTENDENT
NEBB, W9B83 C-K

[redacted]

[redacted]

ECN NO. 3611
ATTACHMENT
SHEET 1 OF 2

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

OCT 1 1982

Docket Nos: 50-390
and 50-391

NEB '82 1006 220

APPLICANT: Tennessee Valley Authority

FACILITY: Watts Bar Nuclear Plant, Units 1 and 2

SUBJECT: SUMMARY OF SEPTEMBER 17, 1982, MEETING TO DISCUSS THE INDEPENDENT DESIGN VERIFICATION FOR THE WATTS BAR 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 (IDV) of the auxiliary feedwater system at the Watts Bar Nuclear Plant. Attendees are listed in Enclosure (1).

During the meeting and by letter dated September 9, 1982, TVA committed to have an independent contractor (Black and Veatch) perform a design and construction review of the Watts Bar auxiliary feedwater system. TVA intends to take this evaluation 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 review, the basis for the selection of the auxiliary feedwater (AFW) system, a definition 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 presentation is attached as Enclosure (2).

Black and Veatch 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. Kenyon, Project Manager
Licensing Branch No. 4
Division of Licensing

Enclosures:
As stated

cc: See next page

8 6 9 3

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

NEDS Accession No. SWP 8 0 [illegible] 1 1 0

ECN NO. 5877
ATTACHMENT 5
SHEET 1 OF 1

PLANT: [illegible] BAR NUCLEAR PLANT

PREPARER ORGANIZATION DATE: P. L. Ellison [illegible]

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, F7[illegible], F767, F783, F784, [illegible]33, F7[illegible], F8[illegible], [illegible]53, F8[illegible], F899, F911, F949, F950, F951, F955, F958, F96[illegible], F964, and [illegible]65.

[illegible] 1-11-8[illegible]

NONCONFORMING CONDITION REPORT

NEDS Accession No. SW [illegible]

ECN NO. [illegible]
ATTACHMENT [illegible]
SHEET 1 OF 1

[illegible] NUCLEAR PLANT

4 ... ORGANIZATION DATE R. L. [illegible]/SW[illegible] January [illegible], 198[illegible]

5 DESCRIPTION OF CONDITION

B[illegible] anchors 47A[illegible]60-3-8 and 47A060-3-10 fail to meet the stiffness requirements for the force in the z-direction as required by Design Criteria WB-DC-40-31.[illegible] section 7.[illegible] Revision 1 of 47A060-3-8 allows 25.6 percent 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, to be transferred through the anchor to the other side. Section 7.1.4 of the design criteria limits a load transferred through anchor to 10 percent.

NON-CONFORMANCE REPORT

MEDS Accession No. SWP 83 0110 124

ECN NO. 5771
ATTACHMENT 2
SHEET 1 OF 1

1 REPORT NO. WBNSWP 115

2 PLANT WATTS BAR NUCLEAR PLANT | 3 UNIT 1

4 PREPARER/ORGANIZATION/DATE R. L. Ilich/SWP/January 10, 1983

DESCRIPTION OF CONDITION

The design for support 03B-1AFW-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 F775.

6 DATE OF OCCURRENCE ESTIMATED December 1978 | 9 SIGNIFICANT CONDITION ADVERSE TO QUALITY YES ☒ NO ☐

7 METHOD OF DISCOVERY Black & Veatch Review

UNID CODE (EN DES-EP 8.01)

10 *BRANCH CHIEF/DATE [signature] 1/10/83

CORRECTIVE ACTION

11 CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES ☐ NO ☐

DESIGN CRITERIA DOCUMENT NO EXCEPTION REQUEST NO

12 ECN REQUIRED ☐ YES NO ☐ ECN NO

13 SCHEDULE IMPACT ☐ ☐ ☐

NONCONFORMANCE REPORT

MEDS Accession No. SWP '83 0110 125

ECN NO. 3544
ATTACHMENT 2
SHEET 1 OF 1

[1] REPORT NO. WBNSWP8272

[3] UNIT 1

PLANT: Watts Bar Nuclear Plant

PREPARER/ORGANIZATION/DATE: J. R. Holloway/SWP/January 10, 1983

DESCRIPTION OF CONDITION

Support 03B-1AFW-R221 Rev 903 was not designed to the specified requirements of support loads table 47B427-469 R0. 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.

DATE OF OCCURRENCE EST (X) ACT ( ): 4/21/82

[9] SIGNIFICANT CONDITION ADVERSE TO QUALITY YES [X] NO [ ]

METHOD OF DISCOVERY: Black and Veatch Review

[10] *BRANCH CHIEF/DATE: EHCh 1/10/83

CODE (EN DES EP 8.01): N/A

CORRECTIVE ACTION

CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES [ ] NO [ ]

DESIGN CRITERIA DOCUMENT NO.: EXCEPTION REQUEST NO.

ECN REQUIRED [ ] YES [ ] NO

[15] SCHEDULE IMPACT

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3511
DATA SHEET NO. 1

BRANCH WBP
PAGE 1

To: _____

From: NPO Project Manager _____ Released By: _____ NPO Project Manager

e: _____ RO SWP '83 03 14 507

Preparing Section	WBP Accession No.	WBP Accession No.
Prepared By: AG	WBP '84 0110 508	
Total Pages (ROI):	WBP '84 0201 503	
Section Supervisor: McCord		
Staff Eng. or Architect:		
Group Head:		
Br. Chief/ Staff Mgr.:		

SCOPE

Project WATTS BAR NUCLEAR PLANT Affected Units 1 & 2

System or Feature Aux. Feedwater (3)

Reference & Description of Change

CLOSED

DATE

CLOSURE SH. #

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PREPARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
9	1-10-84	JRC		TC		MK		ADD DWGS	3
10	2-1-84	JRC		TC		MK		ADD DWGS.	3

P[illegible] No. _____

[illegible] Materials as follows:

Additional Information:

TVA 10575A (EN DES-2-83)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3511
DATA SHEET NO. 1

PAGE

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3511
DATA SHEET NO. 1

BRANCH C65A
PAGE 1

To: Watts Bar Nuclear Plant, Spring City, TN

Design Project Manager SWP-304-88-K

Released By: [signature] Design Project Manager

MAR 14 1983

Preparing Section: TPE-CESB-PASZ	RO SWP '83 0314 507	R4 WBP '830829 507
Prepared By: Michael A Bradley	R1 WBP '830428 513	R5 WBP '830928 532
Total Pages (RO): 02	R2 WBP '830727 504	R6 WBP '831013 505
Section Supervisor: J. E. McCarley	R3 WBP '830808 522	R7 WBP '831028 509
Staff Eng. or Architect:		R8 WBP '831031 524
Group Head: Thomas C Cameron		
Branch Chief: R. D. Bandy 4/29/83 Date		

SCOPE

Project: WATTS BAR NUCLEAR PLANT — Affected Units: 1 & 2

System or Feature: AUX. FEEDWATER - SYSTEM 3

Reference & Description of Change: CHANGES DUE TO BLACK & VEATCH INDEPENDENT REVIEW FINDINGS

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PREPARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
1	4-28-83	JNR	JEM	TC	ROB	MK	JCS	Add Dwg	2
2	7-27-83	JNR	JEM	TCC	ROB	MK	JCS	Add Dwgs	2
3	8-8-83	JNR	JEM	TC	ROB	MK	JCS	Add dwg. est.	2
4	8-29-83	JNR	JEM	TC	ROB	MK	JCS	Add Dwgs	2
5	9-28-83	JMC	JEM	JMC		MK	JCS	ADD DWG'S AND ADD PAGE 3/Revise NOTES	3
6	10-7-83	JMC	JEM	JEM		MK	JCS	ADD DWG	3
7	10-26-83	JRC	JEM	JEM		MK	JCS	DELETE DWGS & U2 EST.	3
8	10-31-83	JRC	JEM	TCC		MK	JCS	ADD DWGS.	3

No. _____
Materials as follows:

Auxiliary Information:

CHIEF, COST PLANNING AND CONTROL STAFF, W12C18 C-K
CHIEF, ARCHITECTURAL SUPPORT BRANCH, W9C120 C-K
CHIEF, CIVIL ENGINEERING BRANCH, W9D220 C-K
CHIEF, ELECTRICAL ENGINEERING BRANCH, W9C136 C-K
CHIEF, SPECIAL DESIGN PROJECTS, W9D220 C-K

PLANT SUPERINTENDENT
CONSTRUCTION PROJECT MANAGER
MGRS, W9D82 C-K
ADMS, 640 C572-C

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3511
DATA SHEET NO. 1

PAGE 2

AFFECTED UNIT	DRAWING OR SKD NUMBER	DWG REV.	ISSUE DATE ESTIMATED	ISSUE DATE ACTUAL	REMARKS	LINE ITEM ON DATA REV.
	[redacted]		~~11-15-83~~	~~9-30-83~~ 9-29-83		
1	47W427-201	6	~~8-30-83~~	~~8-29-83~~	N3-3-4A	
1&2	47W427-207	5	5-30-83	4-28-83	N3-3-13A, 14A	1
	47B427-380	3			N3-3-13A	1
	-382	3			N3-3-14A	1
	-383	5			N3-3-14A	1
	47W427-219	1		4-28-83	05-02	1
1+2	47W427-206	5	7-30-83	7-27-83	N3-3-1A, 2A	2
1	47B427-512	1		7-27-83		2
	-478	2				2
	-513	1				2
1	47W427-203	5			N3-3-10A, 12A	2
2	-205	6			N3-3-9A	2
1	-200	6			N3-3-3A	2
1	-202	7		7-27-83	N3-3-11A	2
~~2~~	~~Unit 2 est 6~~		~~12-30-84~~	DELETE THIS UNIT		~~5~~ 6
1	47W427-201	7	8-30-83	~~8-29-83~~	N3-3-4A	
	47B427-475	2		~~8-29-83~~		
	468	2				
~~1+2~~	484	1		~~8-29-83~~		
1+2	47W401-212	2		9-12-83	200-02-05	
1	47B401-408	1		9-12-83		
	410	1		9-12-83		
	409	1		9-12-83		
1	47B427-373	4		9-12-83	N3-3-3A	
~~2~~	412		~~12-30-83~~	DELETE THIS UNIT	N3-3-15A	~~5~~ 6
1+2	47B401-421	1		9-12-83	200-02-05	
1&2	47W427-207	7	10-28-83	10-3-83	N3-3-13A, 14A	5
1	47W427-203	6			N3-3-10A, 12A	
1	47B427-379	3			N3-3-12A	
1	-378	5				
1	-376	3			N3-3-10A	
1	-375	5				
1&2	47W427-206	6		10-12-83	N3-3-1A, 2A	5
1	-202	8		10-3-83	N3-3-11A	5
1	47B427-377	7		10-3-83		

TVA 10875E (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3511

DATA SHEET NO. 1

AFFECTED UNIT	DRAWING OR SKM NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	47B427-383	6	10-28-83	10-3-83	N3-3-11A	5
1	47W427-200	7	↓	10-3-83	N3-3-3A	↓
1	47B427-380	4		↓	↓	
1	-382	4				
1	-374	3		↓	↓	
1	47W427-201	8		10-3-83	N3-3-4A	
1	47B427-381	5	↓	↓	↓	↓
1	47W427-221	1	10-28-83		N3-3-5A	5
1	-220	2	↓	↓	↓	↓
1	47B427-522	1				
1	-523	1	↓	↓	↓	↓
~~1&2~~	~~47W427-206~~		~~11-11-83~~	DELETE SRC minutes	~~N3-3-1A,2A~~	6
1	47B427-470	2	11-30-83	10-31-83	N3-3-4A	8
1&2	↓ -513	2	↓	↓	N3-3-1A, -2A	↓
1	47W427-200	9	~~12-30-83~~ 1-13-84 SRC	1-10-84	N3-3-3A	9
↓	47W427-201	9	↓	↓	N3-3-4A	↓
	~~-212~~			DELETE SRC minutes	~~N3-3-11A~~	
↓	47W427-202	9	↓	1-10-84	N3-3-11A	↓
	~~-215~~			DELETE SRC minutes	~~N3-3-14A~~	
1&2	47W427-207	9	↓	1-10-84	N3-3-13A, -14A	↓
				DELETE SRC minutes	~~N3-3-14A~~	
1	47W427-227	1	1-31-84	1-31-84	N3-3-10A	10
1	47W427-228	1	1-31-84	↓	N3-3-12A	↓

TVA 10575E (EN DES-7-79)

ENGINEERING CHANGE NOTICE NO. 3511

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 1

PAGE

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE		REMARKS	LINE UP ON DATA REV. NO.
			EXPECTED	ACTUAL		

3511

1

AUXILIARY

AUXILIARY FEEDWATER - 3B

X

NOT INVOLVED

J E M Card

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3511
DATA SHEET NO. 2
Watts Bar Nuclear Plant, Spring City, TN

BRANCH SWP
PAGE 1

To:

From: Design Project Manager SWP 204 C-K
MAR 14 1983

Released By: A. Tomlson
for Design Project Manager

Preparing Section	CG #1
Prepared By:	B.W. WHITTIER
Total Pages (RO):	2
Section Supervisor:	B.W. Whittier
Staff Eng. or Architect:	N/A
Group Head:	A. Tomlson
Branch Chief:	Date

	WBRS Accession No.		WBRS Accession No.
R0	SWP 830314 508	R4	
R1	WBP 830713 518	R5	
R2		R6	
R3		R7	

SCOPE

Project: WATTS BAR NUCLEAR PLANT — Affected Units: 1&2

System or Feature: AUXILIARY FEEDWATER - SYS 3B

Reference & Description of Change: CHANGES DUE TO BLACK & VEATCH INDEPENDENT REVIEW FINDINGS

CLOSED

DATE

CLOSURE SH. -

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PREPARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
1	7-13-83	[illegible]		AL	✓	MK	JCS/	DELETED PAGES	

Reqn No. NO PR

Materials as follows: N/A

Additional Information: N/A

CHIEF, COST PLANNING AND CONTROL STAFF, WT2C70 C-K
CHIEF, ARCHITECTURAL SUPPORT BRANCH, WT2C120 C-K
CHIEF, CIVIL ENGINEERING BRANCH, WT2C220 C-K
CHIEF, ELECTRICAL ENGINEERING BRANCH, WT2C120 C-K
CHIEF, SPECIAL DESIGN PROJECTS, WT2C120 C-K

PLANT SUPERINTENDENT
CONSTRUCTION PROJECT MANAGER
NEDB, WT2B1 C-K
ADMS, WT2 [illegible]-K

0705

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 351
DATA SHEET NO. 2

PAGE 2

AFFECTED UNIT	DRAWING OR SAR NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	INCORPORATED ON DATA SHEET REV. NO.
	Pipe Supports					

[illegible] 3511

AUXILIARY [illegible] 2

AUXILIARY FEEDWATER - 3B

- [X] [illegible] by this section will [illegible] additional [illegible]
- [ ] [illegible] by this section [illegible] require additional materials [illegible]

[illegible]	Unit 1	Unit 2	[illegible] (DES. CONST)	[illegible]	[illegible]

Howard D. Hutchinson

B. W. Whittier /H

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3511
DATA SHEET NO. 4

BRANCH [ ]
PAGE [1]

To: _____

From: NPD Project Manager _____ Released By: _____ NPD Project Manager

"cc": _____

Originating Section: SWP WMG-2	
Prepared By: R. ILICH — Date: 12-1-83	
Total Pages (RO): 2	
Section Supervisor:	
Staff Eng. or Architect:	
Group Head:	
Br. Chief/ SDP Mgr.:	

WBRD Accession No.	WBRD Accession No.
SWP 850314 510	WBP '840223 531
WBP '831201 512	WBP '840306 508
WBP '840109 514	WBP '840315 517
WBP '840201 505	

SCOPE

Project: WATTS BAR NUCLEAR PLANT — Affected Units: 1 & 2

System or Feature: AUXILIARY FEEDWATER - SYS 3B

Reference & Description of Change: CHANGES DUE TO BLACK & VEATCH INDEPENDENT REVIEW FINDINGS.

CLOSED

DATE

CLOSURE SH.

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PREPARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
8	12/1/83	RLI			N/A	MK		ADDED 8 UNIT 1 DWGS.	4
9	1-9-84	RLI			N/A	MK		ADDED DWG.	5
10	2-1-84	RLI			N/A	MK		ADDED DWG. NOS. & DELETE 3 DWGS.	5
11	2-23-84	RLI			N/A	MK		DELETED 2 DWGS	5
12	3-6-84	RLI			2-29	MK		ADDED DWG. NOS.	5
13	3-15-84	RLI			2-29	MK		ADDED DWG. NOS.	5

No. N/A

Materials as follows: N/A

Additional Information: N/A

TVA 10575A (EN DES-2-83)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. _____
DATA SHEET NO. _____

PAGE ☐

AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LAST UPDATE ON DATASHEET REVISED

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2511
DATA SHEET NO. 4

BRANCH SWP
PAGE 1

To: Watts Bar Nuclear Plant, Spring City, TN

From: Design Project Manager SWP 204 C-K
MAR 14 1983

Released By: Design Project Manager

Drawing Section: SWP WMG-2		
Prepared By: G.L. PENNINGTON		
Total Pages (RO): 2		
Section Supervisor: 11/30/82		
Staff Eng. or Architect: NA		
Group Head:		
Branch Chief: Date		

	Design Accounting No.		Design Accounting No.
RO	SWP 830314 510	R4	WBP 830815 549
R1	SWP 830329 520	R5	WBP 830823 519
R2	SWP 830412 518	R6	WBP 830912 507
R3	WBP 830810 501	R7	WBP 831118 507

SCOPE

Project: WATTS BAR NUCLEAR PLANT — Affected Units: 1 & 2.

System or Feature: AUXILIARY FEEDWATER - SYS 3B

Reference & Description of Change: CHANGES DUE TO BLACK & VEATCH INDEPENDENT REVIEW FINDINGS.

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
1	3-29-83	GLP			N/A		JCS	REMOVED 29 DWGS, ADDED 3 DWGS (PAGES 2 & 3)	
2	4-12-83	GLP			N/A		JCS	ADD 2 DWGS (PAGE 3)	3
3	8-10-83	GLP			N/A	MK	JCS/A	ADD 4 DWGS (PAGE 3), REMOVE 3 DWGS	4
4	8-15-83	RLI		SWP	N/A	MK	JCS/A	ADDED UNIT 2 D/G ESTIMATE	4
5	8-23-83	GLP			N/A	MK	JCS/A	ADD 2 DWGS (PAGE 4)	4
6	9-12-83	RLI			N/A	MK	JCS/A	REMOVE UNIT 2 ESTIMATE, CHANGE REF ISSUE DATE	4
7	11-18-83	GLP			N/A	MK	JCS	ADD 9 DWGS (PAGE 4)	4
								SEE NEW SHEET	

No. NA
Materials as follows: NA

Additional Information: NA

CHIEF, COST PLANNING AND CONTROL STAFF, W12C70 C-K
CHIEF, ARCHITECTURAL SUPPORT BRANCH, W9C126 C-K
CHIEF, CIVIL ENGINEERING BRANCH, W9K220 C-K
CHIEF, ELECTRICAL ENGINEERING BRANCH, W9C130 C-K
CHIEF, SPECIAL DESIGN PROJECTS, W9K220 C-K

PLANT SUPERINTENDENT
CONSTRUCTION PROJECT MANAGER
MEDS, W9H3 C-K
ADMS, 640 CST2-C

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3511
DATA SHEET NO. 4

PAGE 2

AFFECTED UNIT	DRAWING OR SKM NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. #
1	47W803-2	18	3-31-83	4-12-83	FSAR Fig 10.4-21	F307
	[redacted]					[redacted]
	47W827-4	18		4-14-83		F302 F303
	-5	7		↓		F304 thru F306
	↓ -6	7		↓		F225
	03B-1AFW-R2	904		3-24-83	NCR WBNSWP8301	F784
	-R3				NCR WBNSWP8301	F767 3
	-R11	902		3-24-83	VOID DWG	F788
	-R24					F810 1
	-R26	906		3-24-83	NCR WBNSWP8301	F794
	-R42	903		3-24-83		F707
	-R52				VOID DWG	F821 1
	-R65					F357 1
	-V57					F358 1
	-R66					F359 1
	-R68					F360 1
	-R72					F361
	-R74					F362 1
	-V90					F814 1
	-R91				NCR WBNSWP8301	F846 1
	-R94					F937 1
	-R100	903		8-10-83		F704
	-R116	903		3-24-83		F751
	-R120					F753 1
	[redacted]	—		—		
	-R180	901		3-24-83	NCR WBNSWP8301	F964
	-R182	903		↓	NCR WBNSWP8301	F965
	↓ -R188	903		4-8-83	NCR WBNSWP8305	F775
	-R207				VOID DWG	F866 1
2	2AFW-R219	902		3-24-83		F772
	1AFW-R221	904		4-8-83	NCR WBNSWP8272	F365
2	2AFW-R223	902		8-10-83	NCR WBNSWP8301	F783
	1AFW-R231	902		3-24-83	NCR 4455R	F718
	-R236				NCR WBNSWP8301	F853 1
	↓ ↓ -R237	903		3-24-83		F370 F372
↓	1-03B-57	902	↓	↓		F919

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3511
DATA SHEET NO. 4

PAGE 3

AFFECTED UNIT	DRAWING OR SKD NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.	
	1-03B-64	904	3-31-83	3-24-83		F820	
	47A060-3-1	1		3-24-83		F764	
	47A427-3-7	2		3-24-83	NCE WBN SWP 8301	F963	
	~~-8-1~~				~~NEW DWG~~	~~F947~~	1
	-5-1	0		3-24-83	NEW DWG	F868	
	-2-32	0		4-8-83	NCE WBN SWP 8301 NEW DWG	F369	
	47A450-3-67	1		3-24-83	NCE WBN SWP 8301	F371	
1	47A060-3-8	2	3-31-83	8-10-83		F319	
	~~47A060-3-9~~					~~F324~~	3
	47A060-3-10	3		8-10-83		F324	
	~~47A060-3-11~~					~~F326~~	3
	1-03A-446	905		3-24-83		F804	
	~~03B-1AFW-R58~~				~~VOID DWG~~	~~F944~~	1
	~~-R59~~					~~F945~~	1
	~~-R67~~					~~F927~~	1
	~~R69~~					~~F929~~	1
	~~-R65~~					~~F941~~	1
	~~-V71~~					~~F933~~	1
	~~-R75~~					F931	
	~~47A060-3-34~~				NCE WBN SWP 8301 NEW DWG	F911	1
	~~47A427-1-3~~					~~F949~~	1
	~~-7-5~~					~~F961~~	1
	~~-7-6~~					~~F965~~	1
	~~-7-7~~					~~F968~~	1
	~~-8-1~~					~~F947~~	1
	~~-8-5~~					~~F932~~	1
2	03B-2AFW-R237	901	3-31-83	3-24-83		F370	1
1	03B-1AFW-V207	908	3-31-83	3-24-83		F756	1
1	47A060-3-3	4	3-31-83	3-24-83		F747	1
1	47A427-5-1A	0	3-31-83	↓	NEW DWG	F868	1
1	1-03B-1	902	3-31-83	↓	VOID DWG	F868	1
2	47A427-2-33	0	4-8-83	4-8-83	NEW DWG	F369	2
1	47A427-2-34	0	4-8-83	↓	NEW DWG	F788	2
	~~03B-1AFW-R~~						
1	03B-1AFW-R150	902	6-20-83	8-10-83		F736	3
1	47A427-4-5	0	8-8-83	8-10-83	NEW DWG	F775	3

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. _____
DATA SHEET NO. _____

BRANCH

PAGE 1

To: _____

From: Design Project Manager _____ Released By: _____
Design Project Manager

Date: _____

Preparing Section		Work Assignment No.		Work Assignment No.
Prepared By:	R0		R4	
Total Pages (RO):	R1		R5	
Section Supervisor:	R2		R6	
Staff Eng. or Architect:	R3		R7	
Group Head:				
Branch Chief: Date				

SCOPE

Project _____ Affected Units _____

System or Feature _____

Reference & Description of Change _____

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	O.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES

Regn. No. _____
Field Materials as follows:

Additional Information:

CHIEF, COST PLANNING AND CONTROL STAFF, W12C76 C-K
CHIEF, ARCHITECTURAL SUPPORT BRANCH, W9C126 C-K
CHIEF, CIVIL ENGINEERING BRANCH, W9D220 C-K
CHIEF, ELECTRICAL ENGINEERING BRANCH, W9C130 C-K
CHIEF, SPECIAL DESIGN PROJECTS, W9D220 C-K

PLANT SUPERINTENDENT
CONSTRUCTION PROJECT MANAGER
HEAD, W9B83 C-K
ADMR, 640 C372-C

TVA 18870E (EN DES-F-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3511

DATA SHEET NO. 4

PAGE 4

TCTED UNIT	DRAWING OR BW NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	03B-1AFW-R188	904	8-9-83	8-9-83	VOID DWGS	3
1	47A060-3-8A	1	8-9-83	↓		3
	~~EXCHANGE 28 ADDITIONAL DWGS~~					6 4
1	[redacted] 1-03B-57	903	11-30-83	12-6-83	NCR 4480R R1	6 5
1	1-03B-64	905	↓	↓	NCR 4481R R1	5
1	1-03A-375	903	903	9-12-83	PLOTTED 02-05 ISOMETRIC 47W401-212	5
1	1-03A-376	903	↓	↓		5
2	03B-2AFW-R3	901	11-30-83	12-1-83	F767	7
1	03B-1AFW-R48	904		12-12-83	F858	7
1	03B-1AFW-R99	903		12-12-83	F858	7
1	03B-1AFW-R233	903		12-1-83	F741	7
1	03B-1AFW-R207	901		↓	F756	7
1	03B-1AFW-V207	910		11-18-83	F756	7
1	47A060-3-34	0		12-1-83	F911	7
1	03B-1AFW-R99	902		12-1-83	DIN 3435	7
1	03B-1AFW-R230	903	↓	↓	DIN 3689	7
≠	[redacted]		[redacted]			[redacted]
1	47A060-3-34A	0	12-9-83	12-1-83	F911	8
1	-34B	0				8
1	-34C	0				8
1	-34D	0				8
1	-34E	0				8
1	-34F	0	↓	↓	↓	8
1	03B-1AFW-R045	903	12-9-83	12-12-83	DIN 3476	8
1	03B-1AFW-R130	902	12-9-83	12-6-83	DIN 3619	8
1	47A060-3-7	3	3-15-84	1-12-84		9
1	47A060-3-5	1		3-15-84		9
1	47A060-3-11	3		3-6-84		9
~~1~~	~~47A060-3-6~~				DELETE	11 9
1	47A060-3-35	2		2-3-84		9
1	47A060-3-36	1		2-1-84		9
1	47A060-3-9	2		3-6-84		9
~~1~~	~~47A060-3-2~~					10 9
~~1~~	~~47A060-3-8~~					10 9

TVA 105796 (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3511

DATA SHEET NO. 4

PAGE 5

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE OUT ON DATA REV. NO.
~~1~~	~~47A060-3-10~~		~~3-15-84~~			10 9
1	47A060-3-4	2		2-1-84		9
~~1~~	~~47A060-3-3~~				DELETE	11 9
1	47A060-3-36A	0		2-1-84		10
	03B-1AFW-R12	902		2-10-84		10
	03B-1AFW-R19	902				10
	03B-1AFW-R20	903		↓		10
	47A427-2-38	0		2-10-84		10
↓	47A427-2-39	0				10
1	47A427-2-40	0	↓			10
1	47A427-2-39A	0				
1	47A427-2-40A	0	↓	↓		
1	47A060-3-9A	1	3-15-84	3-6-84		12
1	-3-9B	1		↓		12
1	-3-11A	0	↓	3-6-84		12
1	47A060-3-5A	0	3-15-84	3-15-84		
1	47A060-3-5B	0		↓		
1	47A060-3-5C	0	↓	↓		

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3511
DATA SHEET NO. 3

BRANCH SWP
PAGE 1

Watts Bar Nuclear Plant, Spring City, Tn

To:

From: Design Project Manager SWP 224 C-K

Released By: A. Johnson
for Design Project Manager

MAR 14 1983

Preparing Section: WCG #2	
Prepared By: D.E. MARTIN	
Total Pages (RO): 2	
Section Supervisor: D.E. Martin	
Staff Eng. or Architect: N/A	
Group Head: A. Johnson	
Branch Chief: Date	

	Work Authorization No.		Work Authorization No.
R0	SWP '83 0314 509	R4	
R1	SWP '83 0401 509	R5	
R2		R6	
R3		R7	

SCOPE

Project WATTS BAR NUCLEAR PLANT Affected Units 1&2

System or Feature AUXILIARY FEEDWATER - SYS 3B

Reference & Description of Change CHANGES DUE TO BLACK AND VEATCH INDEPENDENT REVIEW FINDINGS

CLOSED

DATE

CLOSURE SH.

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO	DATE ISSUED	PREPARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
1	4-1-83	ELP	DEM	AJ	N/A	JCS		Delete 1 drawing	2

Re[illegible] No. NO PR

F[illegible] materials as follows: N/A

Additional information: N/A

CHIEF, COST PLANNING AND CONTROL STAFF, WSCTS C-K
CHIEF, ARCHITECTURAL SUPPORT BRANCH, WSCLDS C-K
CHIEF, CIVIL ENGINEERING BRANCH, WSCEB2S C-K
CHIEF, ELECTRICAL ENGINEERING BRANCH, WSCEB6 C-K
CHIEF, SPECIAL DESIGN PROJECTS, WSCE2S C-K

PLANT SUPERINTENDENT
CONSTRUCTION PROJECT MANAGER
WSCEB, WSCEB3 C-K
ARMS, 640 C572-C

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3511
DATA SHEET NO. 5

AFFECTED UNIT	DRAWING OR SIM NUMBER	SMO REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. #
	~~1-7-83~~					
~~1+2~~	~~1296-1~~		~~4-15-83~~		DELETE	~~FSAR~~ 1
1+2	1296-B	12	4-15-83	5-31-83		FSAR

[redacted]

[illegible] 3611

AUXILIARY [illegible] 3

[illegible] AUXILIARY FEEDWATER - 3B

X Revisions by this section will not require additional [illegible]

☐ Revisions by this section will require additional [illegible] as listed

Item	Unit 1 [illegible]	Unit 2 [illegible]	[illegible] (DES/CONST)	[illegible] Reqn, or Contr	[illegible] Date

Bill Wilson

[illegible]

Douglas E Martin

[illegible] NUCLEAR [illegible] [illegible] 3511

[illegible] AUXILIARY [illegible] 4

[illegible]: AUXILIARY FEEDWATER - 3B

☐ Revisions by this section will not require additional material

☒ Revisions by this section will require additional materials as listed

Item	Unit 1 Qty	Unit 2 Qty	Procured By (ENGRS/CONST)	[illegible]	[illegible]	[illegible]
MISC HANGER MAT'L			CONST			BY FIELD

[signature]

[illegible]

[signature]

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3511
DATA SHEET NO. 8

BRANCH: SWP
PAGE: 1

Watts Bar Nuclear Plant, Spring City, TN

To:

From: Design Project Manager SWP 204 CB-K

MAR 1 4 1983

Released By: [signature] Design Project Manager

Preparing Section	WEG-4
Prepared By:	A. F. NESTASIA
Total Pages (R0):	2
Section Supervisor:	[signature]
Staff Eng. or Architect:	N/A
Group Head:	J. D. Collins [signature]
Branch Chief:	Date

	MEDS Accession No.		MEDS Accession No.
R0	SWP '83 0314 511	R4	
R1	WBP '830419 525	R5	
R2		R6	
R3		R7	

SCOPE

Project: WATTS BAR NUCLEAR PLANT   Affected Units: 1

System or Feature: AUX BLDG CABLE TRAYS

Reference & Description of Change: CHANGES DUE TO BLACK & VEATCH INDEPENDENT REVIEW FINDING F-819 (MECHANICAL)

CLOSED

DATE

CLOSURE SH. #

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
1	4-19-83	AFN	[initials]	JDC/	N/A	MK	JCS/T	ADDED DWG	2

n. No. ______

. Materials as follows:

Additional Information:

CHIEF, COST PLANNING AND CONTROL STAFF, W12C78 C-K
CHIEF, ARCHITECTURAL SUPPORT BRANCH, W9C126 C-K
CHIEF, CIVIL ENGINEERING BRANCH, W9D224 C-K
CHIEF, ELECTRICAL ENGINEERING BRANCH, W9C126 C-K
CHIEF, SPECIAL DESIGN PROJECTS, W9D224 C-K

PLANT SUPERINTENDENT
CONSTRUCTION PROJECT MANAGER
MEDS, W9D63 C-K
ARMS, 640 CST2-C

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3511
DATA SHEET NO. 5

PAGE 2

AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE ITEM ON DATA SH. REV. NO.
1	45W880-12A	8	4/25/83	4-18-83	F819	
1	45W880-12D	8	4/25/83	↓	ADDED DWG	1

SCOPE OF CHANGE ESTIMATE

WATTS BAR NUCLEAR PLANT ECN NO. 3511

BUILDING AUXILIARY

SYSTEM/FEATURE: CABLE TRAYS

☑ Revisions by this section will not require additional material

☐ Revisions by this section will require additional materials as listed below

Item	Unit 1 Qty	Unit 2 Qty	Procured By (EN DES/CONST)	PR, Reqn, or Contr	Requested Delivery Date	Remarks

A.F. NESTASIA
Preparer

E.E. Timmel
Section Supervisor

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2511
DATA SHEET NO. 2

BRANCH WBP
PAGE 1

To: Watts Bar Nuclear Plant, Spring City, TN

NPD Project Manager SWP 204 C-K

Released By: J. E. Hampton for
NPD Project Manager

5-9-83

Preparing Section	WBP WMS # 4
Prepared By:	W. L. KRETON 5-6-83 Date
Total Pages (RO):	2
Section Supervisor:	B. D. Langdale
Staff Eng. or Architect:	N/A
Group Head:	J. E. Hampton
Br. Chief/ SOP Mgr.:	

	MEIDI Accession No.		MEIDI Accession No.
R0	WBP 830509 502	R4	
R1		R5	
R2		R6	
R3		R7	

SCOPE

Project WATTS BAR NUCLEAR PLANT Affected Units 1 ONLY

System or Feature SLEEVE FOR AUX FEEDWATER

Reference & Description of Change NCR 4622 R0 TRIM SLEEVE MK 782 FLUSH WITH NORTH SIDE OF "U" LINE WALL (ONE PLACE)

CLOSED

DATE

CLOSURE SH. #

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES

Drawn. No. N/A

Field Materials as follows: NONE

Additional Information:

TVA 10575A (EN DES-2-83)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3511
DATA SHEET NO. 6

AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL		REMARKS	LINE UP ON DATA REV.
1	47W471-11	22	6-6-83	5-20-83		TRIM SLURRY	

[redacted] [redacted]

SCOPE OF CHANGE ESTIMATE

WATTS BAR NUCLEAR PLANT ECN NO. 3511

BUILDING AUXILIARY

SYSTEM/FEATURE: SLEEVES

☒ Revisions by this section will not require additional material

☐ Revisions by this section will require additional materials as listed below

Item	Unit 1 Qty	Unit 2 Qty	Procured By (EN DES/CONST)	PR, Reqn, or Contr	Requested Delivery Date	Remarks

W. L. Keaton
Preparer

B. D. Crapps
Section Supervisor

[redacted]

ENGINEERING CHANGE NOTICE
COVER SHEET SWP '82 1217 516

(BEFORE ISSUANCE OF OPERATING LICENSE)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ECN NO. 3636

To: Construction Project Manager Watts Bar Nuclear Plant Watts Bar Nuclear Plant, Spring City, TN

From: Design Project Manager SWP 204 GB-K SWP 204 GB-K

DATE DEC . 7 1982

Budget Item 221

Was IJ Analysis Required: Yes ____ No ✓

8303170267 (6)

CHARLES C. FISHER — Prepared by — SWP E2 — Section — [illegible] — Section Leader

J. D. Collins — Project Engineer — Released: [signature] — Design Project Manager — 12/15/82 — Date

SCOPE

Project WATTS BAR NUCLEAR PLANT — Affected Unit(s) 1 & 2

System or Feature AUXILIARY FEEDWATER SYSTEM (3) [illegible]

Reference & Description of Change CHANGE POWER FEEDER FROM CIRCUIT BREAKERS TO CIRCUIT BREAKER WITH MOTOR STARTER FOR ELECTRICAL CIRCUIT PROTECTION. REF: BLACK & VEATCH FINDING REPORT NUMBER E136

DRAWINGS OR B/M'S INVOLVED:

(Data Sheets Required)	Yes or No	Date Branch Data Sheet Available
ENGINEERING SUPPORT BRANCHES		
Mechanical	NO	
Nuclear	NO	
NUCLEAR PROJECTS DESIGN GROUPS		
Civil	NO	
Electrical E2 E4	YES	
Mech	NO	
FOSSIL, HYDRO & SPECIAL PROJECTS DESIGN		
SPECIAL DESIGN PROJECTS	NO	
ARCHITECTURAL SUPPORT BRANCH	NO	

CLOSED
DATE MAR 3 1983

ENGINEERING SUPPORT BRANCHES	Yes or No
Approval Required	YES
ECN is ready for ____ branch review: [signature] Design Project Manager	11-18-82 Date
Approved: N/A — EBB CIVIL BR. CHIEF — Date	
F W Chandler for — EBB ELECTRICAL BR. CHIEF	11-18-82 Date
N/A — EBB MECHANICAL BR. CHIEF — Date	
A A Wilder for — Chief Nuclear Engineer	11-19-82 Date

SWP 83 0303 618

	Yes or No
Required for FSAR or FSAR	YES
Required for Preoperational Test:	NO
If Yes, Test No	
Vendor Backcharges Involved	NO
Seismic Analysis Required	NO
Nonconformance Report Required	NO
QA Applies	YES
Security System Modified	NO
Vendor(s) involved:	NONE

PHYSICAL WORK MUST BE DONE BEFORE

	Pre-Op Test	1st Fuel Load	1% Therm Power	Comm'l Oper'n	1st Refuel	
Unit(s) 1&2		✓				
Unit(s)						

CC (Attachments) No - Yes (2)

CHIEF, ARCHITECTURAL SUPPORT BRANCH, W9C126 C-K
CHIEF, CIVIL ENGINEERING BRANCH, W9D220 C-K
CHIEF, ELECTRICAL ENGINEERING BRANCH, W9C126 C-K
CHIEF, MECHANICAL ENGINEERING BRANCH, W7C126 C-K
CHIEF, NUCLEAR ENGINEER, W10C126 C-K
CHIEF, QUALITY ASSURANCE BRANCH, 5100 NIB-K

CHIEF, COST PLANNING AND CONTROL STAFF, W12C76 C-K
CHIEF, SPECIAL DESIGN PROJECTS, W20220 C-K
MANAGER OF CONSTRUCTION, E7B26 C-K
PLANT SUPERINTENDENT
MGR, W10K1 C-K

1 4 4 4

FOR: Those Listed — DATE: 11/1/82

ADDRESS:

FROM: H. L. Jones — EXTENSION: 4433

ADDRESS: W10A17 C-K

WCN NO 3636
ATTACHMENT 1
SHEET 1 OF 3

WATTS BAR - INDEPENDENT REVIEW

Please handle the attached Black & Veatch review finding number F136 per SEF 82-21.

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, E7B21 C-K

L. T. Perry, W8D200 C-K - Lead

cc: R. M. Pierce, 104 ESTA-K - For Information Only (2)

E. G. Beasley, W12B26 C-K - For Information Only

J. R. Lyons, 902 HBB-K - For Information Only

1950

WATTS BAR NUCLEAR PLANT
B&V PROJECT 10520

FCN NO. 3636
ATTACHMENT 1
SHEET 2 OF 3

FINDINGS REPORT

FINDING NUMBER	FINAL CLASSIFICATION
F/136	TYPE ☐ CATEGORY ☐ (FILLED IN BY SENIOR REVIEW TEAM CHAIRMAN)

DESCRIPTION: (Item B-5 of Electrical checklist) FSAR Subsection 8.3.1.1, page 8.3-23, subsection title Electric Circuit Protection, paragraph two states "... each motor protector is selected and set to protect the motor and its cable, ..." (1) Wiring diagram 45B176B-2E indicates that the following loads are .25HP and are protected

INITIATED BY [signature] DATE 10/30/82

LEAD REVIEWER'S ACTION

REMARKS:

SIGNATURE [signature] DATE 11-1-82

RECOMMENDED CLASSIFICATION
TYPE O
CATEGORY A

PROJECT MANAGER'S ACTION

REMARKS:

SIGNATURE _____ DATE _____

RECOMMENDED CLASSIFICATION
TYPE _____
CATEGORY _____

SENIOR REVIEW TEAM ACTION (COMPLETE FINAL CLASSIFICATION IN BOX ABOVE)

REMARKS:

SIGNATURE _____ DATE _____
(CHAIRMAN)

SHEET 1
CONT'D ON SHEET 2

1951

WATTS BAR NUCLEAR PLANT
B&V PROJECT 10520

FINDINGS REPORT CONTINUED

CN NO. 3636
ATTACHMENT 1
SHEET 3 OF 3

FINDING NUMBER - F 1 3 6

by circuit breaker no EF3-B020.

(2) Aux FW pump B-B lube oil pump B-B (1-MTR-3-128A-B) circuit number 1-4PL-3-6370-B

(3) Aux FW pump valve B-B EHC actuator (1-MTR-3-132-B) circuit number 1-4PL-3-6391-B

Electrical design standard DS-E9.2.1 does not indicate that breaker no EF3-B020 is appropriate for this application.

(4) circuit number 1-4PL-3-6391-B is a 1-3C #12 AWG type WLC (cross linked polyethylene insulation, PVC jacket, 90°C conductor temp rise.

(5) circuit number 1-4PL-3-6370-B is a 1-3C #12 AWG, type WSC-1 (polyethylene insulation, PVC jacket, 75°C conductor temp rise.

(6) Electrical design guide DS-E12.1.2 indicates these cables are appropriate for 15 ampere continuous capacity

Conclusion - A circuit protective device with a 20 ampere trip element is not appropriate for the motor loads and cable sizes used.

~~[illegible]~~

(7) drawing no 45W751-7 rev 15 note 11 states that cables are sized based upon motor load and not ampere rating of breaker. This is not in accordance with the FSAR

Conclusion - Item 7 indicates that the philosophy of sizing cables is not in accordance with FSAR committment. This is a generic problem

SHEET 2
CONT'D ON SHEET —

1952

FORM 1

WATTS BAR NUCLEAR PLANT
INDEPENDENT REVIEW

ECN NO. 3636
ATTACHMENT 2
SHEET 1 OF 2

FINDING RESPONSE

Finding number IFI 1351

Date finding received from Black & Veatch 4 NOV '82
Date

Additional information pertinent to the finding:

ITEM 7 - SECTION 9.3.1.4 | PAGE 9.3-39 OF THE FSAR STATES THAT THE AMPACITY OF CABLES FEEDING MOTOR CIRCUITS IS BASED ON NOT LESS THAN 125% OF THE FULL LOAD CURRENTS. NOTE 11 OF DRAWING 45W751-1 R15 STATES THAT CABLES ARE SIZED BASED UPON MOTOR (SEE ATTACHED)

Comments relative to confirming the finding:

ITEM 6 - THE CONCLUSIONS ARE CORRECT. NEITHER THE CABLE OR MOTOR ARE PROTECTED. THIS SCHEME WAS ONLY USED IN A LIMITED NUMBER OF CASES. THE SITUATION WILL BE CORRECTED.

mp WBN EMB am

L J Perry
Program Team Member

11-3-82
Date

OEDC Program Manager

Date

Date finding response transmitted to Black & Veatch

Date

1953

[redacted]

[redacted]

SHEET

FCN NO 3636
ATTACHMENT 1
SHEET 2 OF 2

COMPUTED DATE

CHECKED DATE

FINDING 136.

LOAD. THERE IS NO DISCONTINUITY BETWEEN THESE STATEMENTS

NOTE

WHEN A CIRCUIT BREAKER 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 DISCONNECTING MEANS FOR THE MOTOR CIRCUIT. IT IS NOT A REQUIREMENT THAT THE BREAKER RATING MATCH THE CABLE RATING.

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3634
DATA SHEET NO. 1

BRANCH SWP
PAGE 1

To: Watts Bar Nuclear Plant, Spring City, TN

From: Design Project Manager SWP 204 C-K

Released By: J. D. Collins for Design Project Manager

Date: JAN 06 1983

Preparing Section	ELECTRKAL #1
Prepared By:	William J. DeRienzo
Total Pages (RO)	2
Section Supervisor:	J. Morris
Staff Eng. or Architect:	N/A
Group Head:	J. D. Collins
Branch Chief:	Date

MEDS Accession No.		MEDS Accession No.	
R0	SWP 83 0120 513	R4	
R1		R5	
R2		R6	
R3		R7	

SCOPE

Project WATTS BAR NUCLEAR PLANT Affected Units 1 & 2

System or Feature SAMPLING [illegible] SYSTEM (43)

Reference & Description of Change DOCUMENTATION CHANGE ONLY.

NO CONSTRUCTION CRAFT MAN-HOURS INVOLVED.

CLOSED
DATE MAR 3 1983

CHANGED : PR-43-227 TO PREV-43-227

HS-43-200 TO FSV-43-200D (DRAFTING ERROR)

FSV-43-210 TO FSV-43-210D

ADDED : ALARM SET POINT TO NAR-43-121P001

REVISED : CONTRACT NUMBER ON FCV-43-40B

ADDED : CROSS REFERENCE BETWEEN H_2ZR-43-56 & H_2ZA-43-91 PER NUC. PR. IDENTIFIED MINOR DRAWING ERRORS AND DISCREPANCIES NO. 287.

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV NO	DATE ISSUED	PREPARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
								8306170203 (3)	

Requisition No. —

For Materials as follows: N/A

SWP 83 0303 617

Additional information: SEE ATTACHMENT 1 TO DATA SHEET

CHIEF, COST PLANNING AND CONTROL STAFF, W12C70 C-K
CHIEF, ARCHITECTURAL SUPPORT BRANCH, W8C120 C-K
CHIEF, CIVIL ENGINEERING BRANCH, W8D220 C-K
CHIEF, ELECTRICAL ENGINEERING BRANCH, W8C170 C-K
CHIEF, SPECIAL DESIGN PROJECTS, W8D220 C-K

PLANT SUPERINTENDENT
CONSTRUCTION PROJECT MANAGER
MEDS, W10A1 C-K
ADMS, 640 C3T2-C

1955

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3634
DATA SHEET NO. 2

PAGE 2

AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINK UPDATED ON DATA SHEET REV. NO.
Hb2	47W610-43-1	10	1-21-83	2-1-83		
Hb2	47W610-43-2	7	1-21-83	1-20-83		
Hb2	47W610-43-5	8	1-21-83			
Hb2	47W610-43-6	11	1-21-83			
Hb2	47W625-12	5	1-21-83	↓		
Hb2	47B601-43-0	21	1-21-83	1-26-83		

1956

ATTACHMENT 1 TO DATA SHEET

SCOPE OF CHANGE ESTIMATE

UNITS BAR NUCLEAR PLANT ECN NO. 3634

BUILDING AUXILIARY BLDG

SYSTEM/FEATURE: SAMPLING & WATER QUALITY SYSTEM(43)

[X] Revisions by this section will not require additional material

[ ] Revisions by this section will require additional materials as listed below

Item	Unit 1 Qty	Unit 2 Qty	Procured By (FS THS/CONST)	PR, Reqn, or Contr	Requested Delivery Date	Remarks

William J Watkins III
Preparer

J Harris
Section Supervisor

1957

TENNESSEE VALLEY AUTHORITY
FIELD CHANGE REQUEST
REPLY MEMORANDUM

WBNP-QCI-1.13 R5
Attachment A
FCR W-7597
NOC

TO : J. C. Standifer, Sequoyah and Watts Bar Design Projects Manager, 204 GB-K (3)

FROM : Guenter Wadewitz, Project Manager, Watts Bar Nuclear Plant CONST

DATE: WBN '82 0819 325

Attention: J L PURKEY (EN DES ON SITE)

SECTION I - CONST REQUEST

(1)

Reason for Change:

- ___ Drawing Discrepancy
- ✓ Facilitate Construction
- ___ Additional Design Information

Status Point:

- ✓ Prior to Fuel Loading
- ___ After Fuel Loading but prior to Closing Capitalized Accounts
- ___ After Closing Capitalized Accounts for the Entire Plant

8212280089

System No. 03B
Work Package No. H003F-20
Work Plan No. N/A

Documents Affected 03B-2AFW-R221 R/0

Marked documents required and attached ✓ Yes ___ No

Document revision required ✓ Yes ___ No

Change Description: REVISE PER THE ATTACHED SKETCHES.

Change requested by: 7-9-82 Daniel E Lawler SEC (CONST Engineer) THOMAS R BROWN (Unit Supervisor)

Change approved by: (EN DES Engineer) 8-2-82 (Date)

Approval obtained by ___ Telephone ___ Memo ✓ Other "ENDES ON SITE"

Approved for submittal to EN DES: Thomas R. Brown (Construction Engineer) Ed Burke (Project Manager)

SWP '82 1207 042

SECTION II - EN DES REPLY/RESOLUTION

FCM No. 51 Date Issued 12-7-82

Drawing Nos: 03B-2AFW-R221 RW. 901

Change Complete Margaret A Cole (Engineer) J C Standifer JC (Design Project Manager) 12-7-82 (Date)

Original - Return to [illegible]
Copy 3 - [illegible]
Copy 2 - [illegible]
Copy 1 - [illegible] original is returned
EDS, 100 Sets

cc: Hanger Inspection Unit

TENNESSEE VALLEY AUTHORITY
FIELD CHANGE REQUEST
REPLY MEMORANDUM

WBNP-QCI-1.13 R7
Attachment A
FCR H-7618
DOC

TO : J. C. Standifer, Sequoyah and Watts Bar Design Projects Manager, 2C4 CB-K (3)

FROM: Guenter Wadewitz, Project Manager, Watts Bar Nuclear Plant CONST

DATE: WEN 83 0425 310

Attention: J.J. NASH (EN DES ONSITE) / A. JONSSON (W20220 C-K)

SECTION I - CONST REQUEST

8311250309 (1)

Reason for Change:

___ Drawing Discrepancy
✓ Facilitate Construction
___ Additional Design Information

Status Point:

✓ Prior to Fuel Loading
___ After Fuel Loading but prior to Closing Capitalized Accounts
___ After Closing Capitalized Accounts for the Entire Plant

System No. 03A
Work Package No. H003F03
Work Plan No. NA

Documents Affected 1-03A-403 (R904) ~~& 48N416 R14~~

Marked documents required and attached ✓ Yes ___ No

Document revision required ✓ Yes ___ No

Change Description: REVISE PER ATTACHMENTS

Change requested by: DOUGLAS R. BROWN (CONST Engineer) MBM 1-12-83

Jiao S Chiao for (Unit Supervisor) 1-14-83

Change approved by: Frank C. Sun (EN DES Engineer) MJS

April 1, 1983 (Date)

Approval obtained by: ___ Telephone ___ Memo ✓ Other EN DES ONSITE

Approved for transmittal to EN DES: Bill E. Hoffman (Construction Engineer)

N J Irish for (Project Manager)

WBP 83 1115 139

SECTION II - EN DES REPLY/RESOLUTION

ECN No. 51

Date Issued 11-3-83

Drawing Nos: 1-03A-403 R905

Change Complete (EN DES Engineer) SJR (Design Project Manager) 11/3 (Date)

Original - Return to CONST by EN DES
Copy 3 - Retained by CONST until original is returned
Copy 2 - Retained by EN DES
Copy 1 - Retained by QC&R
EDS, 100 UB-K

CC: HANGER INSPECTION UNIT

2 2 3 2

TENNESSEE VALLEY AUTHORITY
FIELD CHANGE REQUEST
REPLY MEMORANDUM

Attachment A
FCR H8083
DOC

TO : J. C. Standifer, Sequoyah and Watts Bar Design Projects Manager, 204 GB-K (3)

FROM: Guenter Wadewitz, Project Manager, Watts Bar Nuclear Plant CONST

DATE: WBN 82 0809 312

Attention: J.L. PURKET (EN DES ONSITE) 8209100321 (1)

SECTION I - CONST REQUEST

Reason for Change:

___ Drawing Discrepancy
✓ Facilitate Construction
___ Additional Design Information

Status Point:

✓ Prior to Fuel Loading
___ After Fuel Loading but prior to Closing Capitalized Accounts
___ After Closing Capitalized Accounts for the Entire Plant

System No. 03
Work Package No. H003F20
Work Plan No. NA

Documents Affected 03B-2AFW-R215 (R0)

Marked documents required and attached ✓ Yes ___ No

Document revision required ✓ Yes _____ No

Change Description: ELIMINATE 3/4"ϕ CONCRETE FASTNERS PER ATTACHED SKETCH

Change requested by: ART HIGLEY BRO 7/23/82 (CONST Engineer) 6-15-82

THOMAS R. BROWN (Unit Supervisor)

Change approved by: [signature] (EN DES Engineer) 6-30-82 (Date)

Approval obtained by: ___ Telephone ___ Memo ✓ Other "ENDES ON SITE"

Approved for transmittal to EN DES: THOMAS R. BROWN (Construction Engineer) [signature] (Project Manager)

WBP 83 0914 149

SECTION II - EN DES REPLY/RESOLUTION

FCN No. 4021 Date Issued _____

Drawing Nos: 03B-2AFW-R215 SHT 1&2 R901

Change Complete [signature] (EN DES Engineer) [signature] (Design Project Manager) 9/10/83 (Date)

Original - Return to CONST by EN DES
Copy 3 - Retained by CONST until original is returned
Copy 2 - Retained by EN DES
Copy 1 - Retained by QC&R
EDS, 100 UB-K.

cc: Hanger Inspection Unit

TENNESSEE VALLEY AUTHORITY

FIELD CHANGE REQUEST
REPLY MEMORANDUM

Attachment A
FCR H8236
DOC

TO : J. C. Standifer, Sequoyah and Watts Bar Design Projects Manager, 204 GB-K (3)

FROM: Guenter Wadewitz, Project Manager, Watts Bar Nuclear Plant CONST

DATE: WBN '82 0907 360

Attention: J. L. PURKEY (ENDES ONSITE)   8303220025   ④

SECTION I - CONST REQUEST

Reason for Change:
- ___ Drawing Discrepancy
- ✓ Facilitate Construction
- ___ Additional Design Information

Status Point:
- ✓ Prior to Fuel Loading
- ___ After Fuel Loading but prior to Closing Capitalized Accounts
- ___ After Closing Capitalized Accounts for the Entire Plant

System No. 03A
Work Package No. H003F04
Work Plan No. NA

Documents Affected: 1-03A-458 R/901

Marked documents required and attached ✓ Yes ___ No

Document revision required ✓ Yes ___ No

Change Description: REVISE HANGER PER ATTACHED SKETCHS

Change requested by: [signature] 7-12-82 (CONST Engineer) 6-22-82 [signature] TOM BROWN (Unit Supervisor)

Change approved by: [signature] AS NOTED (EN DES Engineer) 8-4-82 (Date)

Approval obtained by: ___ Telephone ___ Memo FIELD ENDES ✓ Other

Approved for transmittal to EN DES: [signature] (Construction Engineer) [signature] (Project Manager)

SWP '83 0310 072 01

SECTION II - EN DES REPLY/RESOLUTION

ECN No. NA   Date Issued NA

Drawing Nos: Reject! Revised loads per ECNs 2576 & 3210

Change Complete [signature] 1/3/83 (EN DES Engineer) [signature] (Design Project Manager) 3/7/83 (Date)

Original - Return to CONST by EN DES
Copy 3 - Retained by CONST until original is returned
Copy 2 - Retained by EN DES
Copy 1 - Retained by CONST

cc: Hanger Inspection Unit

MEDS, 100 UB-K

1184

FIELD CHANGE REQUEST
REPLY MEMORANDUM

Attachment 2
FCR H 8404
DOC

TO : J. C. Standifer, Sequoyah and Watts Bar Design Projects Manager, 204 GB-K (3)

FROM: Guenter Wadewitz, Project Manager, Watts Bar Nuclear Plant CONST

DATE: WBN 82 0927 313 (209 GB-K)

Attention: J.L. PURKEY, (EN DES ON SITE) / A. JONNSON

SECTION I - CONST REQUEST

8302160435 (1)

Reason for Change:

___ Drawing Discrepancy
✓ Facilitate Construction
✓ Additional Design Information

Status Point:

✓ Prior to Fuel Loading
___ After Fuel Loading but prior to Closing Capitalized Accounts
___ After Closing Capitalized Accounts for the Entire Plant

System No. 03
Work Package No. 4003F15
Work Plan No. NA

Documents Affected 03B - 14FW - R126 R 902

Marked documents required and attached ✓ Yes ___ No

Document revision required ✓ Yes ___ No

Change Description: REVISE TO SHOW HANGER 03B-14FW-R126 ATTACHING TO 03B-14FW-R141 AS SHOWN ON ATTACHED SKETCH. APPROVE ATTACHMENT TO EXISTING STEEL PLATFORM AS SHOWN REF NCR 3639R.

Change requested by: 9-1-82 JO Applewhite (CONST Engineer) for THOMAS R. BROWN (Unit Supervisor)

Change approved by: [signature] (EN DES Engineer) September 14, 1982 (Date) ON SITE EN DES

Approval obtained by: ___ Telephone ___ Memo ✓ Other

Approved for transmittal to EN DES: [signature] for (Construction Engineer) [signature] (Project Manager)

SWP '83 0208 054

SECTION II - EN DES REPLY/RESOLUTION

FCN No. S1 Date Issued 1/28/83

Drawing Nos: 03B-1AFW-R126 Sh 1 R903 AND Sh 2 R903

Change Complete [signature] (EN DES Engineer) [signature] for (Design Project Manager) 1/28/83 (Date)

Original - Return to CONST by EN DES
Copy 3 - Retained by CONST until original is returned
Copy 2 - Retained by EN DES
Copy 1 - Retained by QC&R
TEDS, 100 UB-K

cc: Hanger Inspection Unit

1956

TENNESSEE VALLEY AUTHORITY
FIELD CHANGE REQUEST
REPLY MEMORANDUM

DRB 11-1-82 E7
WBNP-QCI-1.13 R6
Attachment A
FCR HB721
DOC

TO : J. C. Standifer, Sequoyah and Watts Bar Design Projects Manager, 204 GB-K (3)

FROM: Guenter Wadewitz, Project Manager, Watts Bar Nuclear Plant CONST

DATE: WBN 82 1228 337

Attention: J.J. NASH (EN DES ONSITE) 8312080579 (1)

SECTION I - CONST REQUEST

Reason for Change:

✓ Drawing Discrepancy
___ Facilitate Construction
✓ Additional Design Information

Status Point:

✓ Prior to Fuel Loading
___ After Fuel Loading but prior to Closing Capitalized Accounts
___ After Closing Capitalized Accounts for the Entire Plant

System No. 03A
Work Package No. H003F03
Work Plan No. NA

Documents Affected 1-03A-405 (R903)

Marked documents required and attached ✓ Yes ___ No

Document revision required ✓ Yes ___ No

Change Description: REVISE HANGER 1-03A-405 AS SHOWN ON THE ATTACHMENTS.

Change requested by: 10-18-82 DOUGLAS R. BROWN DRB 10-25-82 (CONST Engineer) THOMAS R. BROWN (Unit Supervisor)

Change approved by: Clyde K. Back (EN DES Engineer) 10/22/82 (Date)

Approval obtained by: ___ Telephone ___ Memo ✓ Other

Approved for transmittal to EN DES: WBP '83 1129 220 Thomas R. Brown (Construction Engineer) Ed Burke (Project Manager)

SECTION II - EN DES REPLY/RESOLUTION

ECN No. 3667 Date Issued ~~11-7-83~~ 11-17-83

Drawing Nos: 1-03A-405 ~~R8~~ R904

Change Complete J.C. Crawford (EN DES Engineer) GLP J.J. Nash (Design Project Manager) 11/15/83 (Date)

Original - Return to CONST by EN DES
Copy 3 - Retained by CONST until original is returned
Copy 2 - Retained by EN DES
Copy 1 - Retained by OC&R
MEDS, 100 UB-K

8 8 4

NEB830422260 Closed KKN [illegible]

TVA 10618 (EN DES-10-81)

COMMITMENT TRACKING RECORD

1 RESPONSIBLE ORGANIZATION	2 DATE FILED	3 CHECKUP DATES	4 DUE DATE	5 IDENTIFICATION NUMBER
EEB	4-21-83	8-1-83	10-1-83	WBN-R189

6 COMMITMENT TITLE [illegible] Item 309

7 SAR TECHNICAL RESPONSIBILITY	8 NLS RESPONSIBILITY	9 COMMITMENT LOCATION
EEB	KKN	E.G. Beasley to OEDC mo Files dated 4/14/83 (EDC830414 401)

10 TRANSMITTAL RECORD (FROM–TO–DATE (MEDS NO.)) – FOR NLS USE ONLY

JAR to FWC 4/22/83 (NEB830422260) [illegible]
JAR to FWC 4/28/83 (NEB830428 266)
FWC to JAR 5/19/83 (EEB830523912)

11 EXPLANATION

[illegible]

831020E0165 (2)

MEDS, W5B63 C-K

NEB '831017 938

12 RESOLUTION (FILL OUT ONLY AT CLOSURE) Closed - [illegible] to [illegible]
(NEB830524 264) Transmittal Pkg. # 373
KKN 6/6/83

DOCUMENT OR SYSTEM TRACKING OR CLOSING COMMITMENT: [DOC/SYS: DATE ENTERED:]

(STATUS AND INSTRUCTIONS–OVER)

C 82

13 STATUS

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 parenthesis a person to contact. Commitment Location (block 9) should cite 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.

KKN Log 4/21 Encl

EN DES-EP 2.07
Attachment No. 1
Page 1 of 2

COMMITMENT TRACKING RECORD

1 RESPONSIBLE ORGANIZATION	2. DATE FILED	3 CHECKUP DATES	4 DUE DATE	5 IDENTIFICATION NUMBER
NEB	4-20-83	5/1/83	6/1/83	WBN-R190

6 COMMITMENT TITLE: Revision of WBN FSAR to add TPIPE

7 SAR TECHNICAL RESPONSIBILITY	8 NLS RESPONSIBILITY	9 COMMITMENT LOCATION
	KKN	Black and Veatch Finding F 302

10 TRANSMITTAL RECORD [FROM–TO–DATE (MEDS NO.)] – FOR NLS USE ONLY

ROB to JAR 4/21/83 (CEB830421009)
JAR to CMM 4/21/83 NEB830421 263 Pkg No# 369

11 EXPLANATION

The WBN FSAR does not contain a description of the piping analysis program "TPIPE". TPIPE has been used to perform ASME Code class 2 and 3 analysis at WBN

The revision was sent to NEB by CEB830401014

12 RESOLUTION (FILL OUT ONLY AT CLOSURE) Closed per Raulston to Mills memo dated 4/21/83 (NEB830421263) Transmitting FSAR change in package #369.

DOCUMENT OR SYSTEM TRACKING OR CLOSING COMMITMENT: [DOC/SYS: DATE ENTERED:]

Form TVA 10618 (STATUS AND INSTRUCTIONS–OVER)

13 STATUS

Instructions:

The organization making or identifying a commitment fills out Commitment Tracking Record (CTR) blocks 2, 3, 4, 5, 9, and 11, and (if known) block 1. Block 1 should name the responsible organization, and in parenthesis a person to contact. Commitment Location (block 9) should cite 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.

TVA 10510 (EN DES - 9-83)

COMMITMENT TRACKING RECORD

Closed

1 RESPONSIBLE ORGANIZATION(S)	2 DUE DATE(S)	3 DATE FILED	4 APPLICABLE TO (PLANT/UNITS)	5 IDENTIFICATION NUMBER
ACTION (ORG - GROUP - SUPV) (1) MEB - CFB (2) (3) (4)	~~11/30/84~~ 12/30/83	10 12 83	WBN Units 1 & 2	WBN-R266

8403030198

6 COMMITMENT TITLE: Auxiliary Feedwater System Pressure Drop Calculations - Black & Veatch Items F312 & F355

7 SAR TECHNICAL RESPONSIBILITY	8 NLS RESPONSIBILITY	9 COMMITMENT LOCATION
MEB	K.L. Napier	Memo from H.L. Jones to those listed, 3/28/83 EDC830328402

10 TRANSMITTAL RECORD (FROM - TO - DATE (MEDS ACCESSION NO.)) - FOR NLS USE ONLY

JAR to CAC 11/1/83 NEB831101284
CAC to JAR 11/21/83 MEB831121004
CAC to JAR 12/21/83 MEB831221023

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 Calculations For Auxiliary Feedwater System — 12/30/83 — MEB-CFB

NEB '840224 899

12 RESOLUTION (FILL OUT ONLY AT CLOSURE)

Closed per memorandum From C.A. Chandley to John A Raulston dated 2/7/84 MEB840207dio

DOCUMENT OR SYSTEM TRACKING OR CLOSING COMMITMENT: (DOC/SYS: DATE ENTERED: KKH 2/22/84

(STATUS AND INSTRUCTIONS - OVER)

13 STATUS Memo from CDC to Dan dated 11/2/82 MEB831112 1004 requesting an extension till 1/20/83. [illegible]

Instructions:

The organization making or identifying a commitment fills out Commitment Tracking Record (CTR) blocks 1, 2, 4, 6, 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 then 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 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 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 equivalent tracking system and should include the equivalent tracking system's name and the entry number and date.

In either case, the MEDS accession numbers of applicable documents should be included.

DIVISION OF ENGINEERING DE[illegible] 8104170908

NONCONFORMANCE REPORT [1] REPORT NO. WBNEEB8104

[2] *PROJECT Watts Bar NP [3] PLANT [4] UNITS 1 and 2

[5] PREPARER/ORGANIZATION/DATE W. H. Nelson, EEB, February 6, 1981

[6] DESCRIPTION OF CONDITION

The nameplate rating for the attached list of electric motors is 440 volts. They are powered from the nominal 480V safety-related power system, which was designed to supply motors rated at 460 volts. If the continuous operating voltage range for the listed motors is ± 10 percent of rated, they will be subjected to voltages higher than their rating. The attached motor list is identified as "Motor List for NCR WBNEEB8104."

8312220146 (4)

[7] DATE OF OCCURRENCE EST ( ). ACT. (X) 2/6/81

[8] METHOD OF DISCOVERY Design Review

[9] UNID CODE (EN DES-EP 8.01) N/A

[10] SCHEDULE IMPACT ☐P ☐A ☒N

[11] ECN REQUIRED ☒ YES ☐ NO ECN 4460

[12] SIGNIFICANT CONDITION ADVERSE TO QUALITY YES ☒ NO ☐

[13] *BRANCH CHIEF/DATE RKR EW Chandler 4/17/81 ACT ENG EEB JCK

[14] CORRECTIVE ACTION:

See Attachment A

[15] ASSIGNABLE CAUSE: (REQUIRED IF SIGNIFICANT)

See Attachment A

[16] ACTION REQUIRED TO PREVENT RECURRENCE: (REQUIRED IF SIGNIFICANT)

See Attachment A

MEB 831101 001
MEDS ACCESSION NO.

[17] ~~INDEPENDENT~~ QA ENGINEER REVIEW AND CONCURRENCE: EW Bapp 11/13/83

[18] LABOR EST. ( ). ACT. ( ) N/A MH [19] SCHEDULE EST. ( ). ACT. ( ) N/A DAYS

[20] ACTIVITY NO. N/A [21] TASK DESCRIPTION N/A [22] DATE INITIATED N/A

[23] REMARKS:

~~Referred to EEB for handling and resolution February 4, 1983.~~ BMG
~~Referred to MEB for procurement of dump/motor units.~~ 3/14/83 BMG
Referred to MEB for final disposition on March 7, 1983. BMG 4/4/83

[24] DISTRIBUTION:
OEB QA GROUP-ENGINEERING SECTION
OEDC QA
MEB-MLS (For Significant NCR's)**
[illegible] (For Significant NCR's)
W. H. Nelson, W8896 C-K

[25] ALL ACTION COMPLETE: C A Chandler 12-4-83
BRANCH CHIEF/ORG DATE

[26] *NCR CLOSED: QAB 82 1129 003
CHIEF, QUALITY ENGINEERING BRANCH DATE

OEB USE MEB 831215 014

**DISTRIBUTE AFTER THIS SIGNATURE

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
2 - Mtr-82-B1-B
1 - Mtr-82-B2-B
2 - Mtr-82-B2-B

EN DES
NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

NCR NO. WBNEEB8104

SIGNIFICANT
YES ■ NO □

REPORTABLE
YES ■ NO □

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 ■ No □ If yes, list in (C) below.

C. Documents related to the NCR (ECN, analyses, memos, contract No., etc.)

	REF OR MEDS ACCESS. NO.	STATUS WORKING (see (F) below)	STATUS COMPLETE
ECN 4460	WBP831114521		X
Memo T.J.C. Standifer From G. Wadewitz	WBNT31206005		X
TVA contract 83K8-833257	MED830825536		X

D. Is action by organization outside EN DES required? Yes ■ No □
Organization tracking No. (NCR, QCIR, etc.) CTR WBN-E090

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. If any document listed in (C) above is indicated in the working status block, item 26 24 on the NCR cannot be signed.

G. Is all EN DES action complete? Yes ■ No □

H. Remarks:

Verified By N.E. Akins Date 12-14-83

ATTACHMENT A

Sheet 1 of 1

Nuclear Project:	NONCONFORMING CONDITION REPORT CONTINUATION PAGE	NCR No. WBNEER8104

Item No.	REMARKS
14	Corrective Action The diesel generator lube oil circulating pumps and the control bay sump pumps perform no safety function. Therefore they are not included in the TVA QA program and are excluded from the non-conformance reporting requirements of 10CFR50 Appendix B. The AFW lube oil pumps, however, are safety-related. The existing motors are being replaced with Class 1E motors of the proper voltage rating (460 V ac) under TVA contract 83K8-833257.
15	Assignable Cause: Voltage requirements for the AFW lube oil pump motors were not defined in TVA procurement specification 1547.
16	Action Required to Prevent Recurrence: TVA standard specification SS-E9.2-01 was issued on 12-7-77 and defined required motor voltage ratings. No other action is required.

EI [illegible] 1.36
Attachment No. 1
Page 1 of 2

DIVISION OF ENGINEERING DESIGN

CEB '82 0414 017 NONCONFORMANCE REPORT [1] REPORT NO. WBNCEB8206

[2] PROJECT SWP [3] PLANT WBN [4] UNIT 1 and 2

[5] PREPARER/ORGANIZATION/DATE G. D. 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.

8207290033

(1)

[7] DATE OF OCCURRENCE EST ( ), ACT. ( ) Unknown

[8] METHOD OF DISCOVERY Design-Data Review

[9] UNID CODE (EN DES-EP 8.01)

[10] SCHEDULE IMPACT ☐P ☐A ☐N

[11] ECN REQUIRED ☐ YES ☐ NO

[12] SIGNIFICANT CONDITION ADVERSE TO QUALITY YES ☒ NO ☐

[13] *BRANCH CHIEF/DATE [signature] 4/14/82

[14] CORRECTIVE ACTION: 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.

[15] 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.

[16] ACTION REQUIRED TO PREVENT RECURRENCE: (REQUIRED IF SIGNIFICANT)
The computer program and analysis technique are no longer being used.

[17] *QA ENGINEER REVIEW AND CONCURRENCE: [signature] 7-15-82

[18] LABOR EST. ( ), ACT. ( ) MH [19] SCHEDULE EST. ( ), ACT. ( ) DAYS

[20] ACTIVITY NO. [21] TASK DESCRIPTION [22] DATE INITIATED

[23] REMARKS:

[24] DISTRIBUTION:
[27] QER QA GROUP-ENGINEERING SECTION
OEDC QA
NEB-NLS (For Significant NCR's)**
NEDS
NSRS (For Significant NCR's)
G. D. Felpel
CEB
W9D209 C-K
*DISTRIBUTE AFTER THIS SIGNATURE
**HANDCARRY COPY TO NEB-NLS ALSO

[25] ALL ACTION COMPLETE: [signature] for BRANCH CHIEF/ORG. 7/22/82 DATE

[26] *NCR CLOSED QAS 820511 004 CHIEF, QUALITY ENGINEERING BRANCH DATE

OER USE CEB '82 0727 004

EEB830225906

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

1 REPORT NO. WBNEEB8208

2 PLANT Watts Bar Nuclear | 3 UNITS 1 and 2

4 PREPARER/ORGANIZATION/DATE L. T. Perry/EEB/11-22-82

5 DESCRIPTION OF CONDITION

The electric motors on the auxiliary oil pumps for the auxiliary feedwater pumps are required to be Class 1E devices environmentally qualified per NUREG-0588 guidelines. These motors were not purchased as Class 1E devices and cannot be determined to be environmentally qualified per NUREG-0588 guidelines.

8303040591 (2)

6 DATE OF OCCURRENCE EST ( ), ACT. (X) 11-22-82

7 METHOD OF DISCOVERY Independent Design Review

8 UNID CODE (EN DES-EP 8.01) N/A

9 SIGNIFICANT CONDITION ADVERSE TO QUALITY MRB YES [X] NO [ ]

10 *BRANCH CHIEF/DATE [signature] 2/24/83

11 CORRECTIVE ACTION

N/A See Remarks.

12 CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES [ ] NO [ ]

13 DESIGN CRITERIA DOCUMENT NO. EXCEPTION REQUEST NO.

14 ECN REQUIRED [ ] YES NO [ ] ECN NO. | 15 SCHEDULE IMPACT [ ] P [ ] A [ ] N

NONCONFORMANCE REPORT

[1] REPORT NO. WBNEEB8203

[16] ASSIGNABLE CAUSE (REQUIRED IF SIGNIFICANT)

[17] THIS IS A GENERIC CONDITION YES ☐ NO ☐

[18] ACTION REQUIRED TO PREVENT RECURRENCE. (REQUIRED IF SIGNIFICANT)

[19] *QA ENGINEER REVIEW AND CONCURRENCE

[20] LABOR EST. ( ), ACT. ( ) MH | [21] SCHEDULE EST. ( ), ACT ( ) DAYS

[22] ACTIVITY NO. | [23] TASK DESCRIPTION | [24] DATE INITIATED

[25] REMARKS:

~~This NCR has been referred to MEB for handling and resolution per EEB.~~
~~Referred to EEB for handling and resolution February 6, 1981.~~
This NCR closed because this deficiency is covered by NCR WBNEEB8104 dated February 6, 1981.

[27] DISTRIBUTION:
[28] CONST PROJECT MANAGER
EN DES PROJECT MANAGER
QAB
OEDC QA
NEB (for Significant NCR's)**
MEDS
NSRS (for Significant NCR's)
L. T. Perry, W8D200 C-K
* DISTRIBUTE AFTER THIS SIGNATURE
** HANDCARRY COPY TO NEB-NLS

[26] ALL EN DES ACTION COMPLETE

*BRANCH CHIEF/ORG. — DATE: 2/24/83

EEB 8302250906

EEB830225906

8303040592 (1)

EN DES
NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

NCR NO. WBNEEB8208

SIGNIFICANT
YES ☒ NO ☐

REPORTABLE
YES ☐ NO ☒

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 ☐ No ☐ If yes, list in (C) below.

C. Documents related to the NCR (ECN, analyses, memos, contract No., etc.)

	STATUS	
REF OR MEDS ACCESS. NO.	WORKING (see (F) below)	COMPLETE
N/A		

D. 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 ☒ 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 ☐

H. Remarks:

Deficiency already included in NCR WBNEEB8104.

Verified By S. N. Arnold Date 2/24/83

2/23 T A G

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

CEB '82 1112 008

[1] REPORT NO. GENCEB8213

[2] PLANT Sequoyah, Watts Bar, Yellow Creek | [3] UNIT All

[4] PREPARER/ORGANIZATION/DATE K. R. Spates/CEB/11-8-82

[5] DESCRIPTION OF CONDITION

The Sequoyah and Watts Bar FSARs and the Yellow Creek PSAR committed TVA to consider 5-percent eccentricity in the seismic analysis of axisymmetric structures. These commitments were not met in the analyses of the containment vessels for these plants.

8401111E0102

(2)

[6] DATE OF OCCURRENCE EST (X), ACT. ( ) 1974-1978

[7] METHOD OF DISCOVERY Review of WBN containment seismic analysis

[8] UNID CODE (EN DES-EP 8.01) R6

[9] SIGNIFICANT CONDITION ADVERSE TO QUALITY YES [X] NO [ ]

[10] *BRANCH CHIEF/DATE [signature] 11/9/82

DE DED 11/9/82 SAG

[11] CORRECTIVE ACTION:

[12] CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES [ ] NO [ ]

[13] DESIGN CRITERIA DOCUMENT NO. EXCEPTION REQUEST NO.

[14] ECN REQUIRED [ ] YES NO [ ] ECN NO. [15] SCHEDULE IMPACT [ ] P [ ] A [ ] N

NONCONFORMANCE REPORT

[1] REPORT NO. _____

[16] ASSIGNABLE CAUSE: (REQUIRED IF SIGNIFICANT)

[17] THIS IS A GENERIC CONDITION YES ☐ NO ☐

[18] ACTION REQUIRED TO PREVENT RECURRENCE: (REQUIRED IF SIGNIFICANT)

[19] *QA ENGINEER REVIEW AND CONCURRENCE:

[20] LABOR EST. ( ), ACT. ( ) MH [21] SCHEDULE EST. ( ), ACT. ( ) DAYS

[22] ACTIVITY NO. [23] TASK DESCRIPTION [24] DATE INITIATED

[25] REMARKS:

This NCR has been superseded by NCR GENCEB8213 R1 (CEB 830728 012) which separates YCN from SQN and WBN.

[27] DISTRIBUTION:
[28]
CONST PROJECT MANAGER
EN DES PROJECT MANAGER
QAB
OEDC QA
NEB (for Significant NCR's)**
MEB6
RSB1 (for Significant NCR's)
K. R. Spates, W9A24 C-K
* DISTRIBUTE AFTER THIS SIGNATURE
** HANDCARRY COPY TO NEB-NLS

[26] ALL EN DES ACTION COMPLETE:
JAE
*BRANCH CHIEF/ORG.
12/22/83
DATE

CEB '83 1222 008

CEB '82 0707 010

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

[1] REPORT NO WBNCEB8215

[2] PLANT WBN

[3] UNIT 1 and 2

[4] PREPARER/ORGANIZATION/DATE J. E. McCord/EN DES - CEB/5-5-82

[5] DESCRIPTION OF CONDITION

8404060029 3

Operating Condition Data

Attached.

[6] DATE OF OCCURRENCE EST ( ), ACT. ( )

[7] METHOD OF DISCOVERY

[8] UNID CODE (EN DES-EP 8.01)

[9] SIGNIFICANT CONDITION ADVERSE TO QUALITY YES [X] NO [ ]

[10] *BRANCH CHIEF/DATE R D Guthrie for R C Barnett 5/5/82

[11] CORRECTIVE ACTION

Review analysis by implementation of a sampling program governed by a special engineering procedure and evaluate the difference between documented operational modes and analysis operational modes. The CEB Report 80-2 will be voided and replaced with the operational modes in a QA document.

[12] CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES [ ] NO [X]

[13] DESIGN CRITERIA DOCUMENT NO. EXCEPTION REQUEST NO.

[14] ECN REQUIRED [ ] YES NO [ ] ECN NO.

[15] SCHEDULE IMPACT [ ] P [ ] A [ ] N

NONCONFORMANCE REPORT

[1] REPORT NO WBNCEB8215

[16] ASSIGNABLE CAUSE (REQUIRED IF SIGNIFICANT)

The operational modes data used for piping system analyses in the auxiliary building at Watts Bar Nuclear Plant are not documented. The operational mode data for reactor building piping was generated by EDS Nuclear and issued in Civil Engineering Branch Report 76-2. In the above cited cases, a procedure did not exist to assure that revised data was reviewed for effects on previous issued analyses.

[17] THIS IS A GENERIC CONDITION YES ☐ NO ☒

[18] ACTION REQUIRED TO PREVENT RECURRENCE (REQUIRED IF SIGNIFICANT)

Documents concerning operational modes will be maintained as retrievable records in accordance with TVA's Quality Assurance Program. When a 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.

[19] ~~QA ENGINEER REVIEW AND CONCURRENCE~~ INDEPENDENT REVIEW

[20] LABOR EST ( ), ACT. ( ) MH [21] SCHEDULE EST ( ), ACT ( ) DAYS

[22] ACTIVITY NO [23] TASK 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. CEB 840307 003.

[27] DISTRIBUTION:
[28] CONST PROJECT MANAGER
EN DES PROJECT MANAGER
QAB
OEDC QA
NEB (for Significant NCR's)**
~~MEDS~~
NSRS (for Significant NCR's)

* DISTRIBUTE AFTER THIS SIGNATURE
** HANDCARRY COPY TO NEB-NLS

[26] ALL EN DES ACTION COMPLETE

JAE

*BRANCH CHIEF/ORG. 3/26/84 DATE

CEB'840326 007

Operating Condition Data

The Quality Assurance Criteria 10CFR50, 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 CEB 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, B. Isometrics, 1 (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° F operating condition for analysis problems 0600200-02-05, -06, -07, -08, -05-01, and -02.

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

MEDS Accession No. CEB 830114 010

(See "NOTE" in Block 25) CEB 841105 018

[1] REPORT NO. WBNCKR8222 R1

[2] PLANT Watts Bar Nuclear Plant

[3] UNIT 1 and 2

[4] PREPARER/ORGANIZATION/DATE T. L. Paul/EN DES-CEB/1-6-83

8411210427

[5] DESCRIPTION OF CONDITION

EN DES-EP 3.03 requires that design calculations be prepared, checked, placed in a volume, and be sent to MEDS. Some of the analysis calculations have not met this requirement. An example is N3-62-9A.

Flange evaluations were omitted in some of the analysis calculations. An example of this is the analysis calculation for N3-3-14A. R1

[6] DATE OF OCCURRENCE EST (X), ACT. ( ) 1975

[7] METHOD OF DISCOVERY Review

[8] UNID CODE (EN DES-EP 8.01)

[9] SIGNIFICANT CONDITION ADVERSE TO QUALITY YES [X] NO [ ]

[10] *BRANCH CHIEF/DATE 1/13/83

[11] CORRECTIVE ACTION:

Review all problems on WBN to ensure that all flange qualification requirements have been met. Review all analyses to ensure that they are prepared, checked, and sent to MEDS.

[12] CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES [ ] NO [X]

[13] DESIGN CRITERIA DOCUMENT NO. EXCEPTION REQUEST NO.

[14] SCN REQUIRED [ ] YES NO [X] (SCN NO.)

[15] SCHEDULE IMPACT [ ] P [ ] A [ ] N

NONCONFORMANCE REPORT

[1] REPORT NO. WBNCEB8222 R1

[16] ASSIGNABLE CAUSE: (REQUIRED IF SIGNIFICANT)

WBN piping analysis section was using preliminary data in the original issue of these rigorous analysis problems. These analyses were not documented according to the EN 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.

[17] THIS IS A GENERIC CONDITION YES ☐ NO ☒

[18] 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.

[19] *INDEPENDENT REVIEW: CCarrier CWagner 8-12-83 8/15/83

[20] LABOR EST. ( ), ACT. ( ) MH [21] SCHEDULE EST. ( ), ACT. ( ) DAYS

[22] ACTIVITY NO.	[23] TASK DESCRIPTION	[24] DATE INITIATED

[25] 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 ~~Veech~~. Veatch EoB 10/31/84

Note: This NCR was resubmitted to MEDS to complete block 3 which was inadvertently left blank.

[27] DISTRIBUTION:
[28] CONST PROJECT MANAGER
EN DES PROJECT MANAGER
CHIEF, ESB
OFFICE OF QA
NEB (for Significant NCRs)**
MEDS CS
NEB (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

[28] ALL EN DES ACTION COMPLETE:

*BRANCH CHIEF/ORG. DATE

MEDS ACCESSION NO.

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

CEB '82 1129 001

[1] REPORT NO. WBNCEB8232

[2] PLANT Watts Bar

[3] UNIT S 1 and 2

[4] PREPARER/ORGANIZATION/DATE C. G. Wagner/TPE-CEB-PAS2/11-9-82

[5] DESCRIPTION OF CONDITION

The support design load of 1850 pounds indicated on document 47B427-47OR1 for the variable spring at node 133 is inaccurate. Analysis problems N3-3-4A and 0600200-02-05 have an overlap region with the inclusion of node 133. Neither analysis confirms nor is within 10 percent of the recorded support design value. The NCR was caused probably while transposing numbers from the computer printout to the support load table and was not caught by the checker.

8404068U912 (3)

[6] DATE OF OCCURRENCE EST (X), ACT. ( ) 1/82

[7] METHOD OF DISCOVERY Black & Veatch Review

[8] UNID CODE (EN DES-EP 8.01)

[9] SIGNIFICANT CONDITION ADVERSE TO QUALITY YES ☐ NO ☒

[10] *BRANCH CHIEF/DATE 11-22-82 11/29/82

[11] CORRECTIVE ACTION:

An evaluation of the deficiency exposed improper lapping techniques used in problem 0600200-02-05. The analysis was reanalyzed following the WBN Rigorous Analysis Handbook, section 200, which explains proper lapping techniques. The work was performed under ECN 3511.

[12] CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES ☐ NO ☒

[13] DESIGN CRITERIA DOCUMENT NO. EXCEPTION REQUEST NO.

[14] ECN REQUIRED ☒ YES NO ☐ ECN NO. 3511

[15] SCHEDULE IMPACT ☐ P ☐ A ☐ N

NONCONFORMANCE REPORT

[1] REPORT NO. 1

[16] ASSIGNABLE CAUSE: (REQUIRED IF SIGNIFICANT)

[17] THIS IS A GENERIC CONDITION YES ☐ NO ☐

[18] ACTION REQUIRED TO PREVENT RECURRENCE: (REQUIRED IF SIGNIFICANT)

[19] ~~XXX ENGINEERING REVIEW AND CONCURRENCE~~ INDEPENDENT REVIEW: Donald W. Piper 8-24-83

[20] LABOR EST. ( ), ACT. ( ) MH [21] SCHEDULE EST. ( ), ACT. ( ) DAYS

[22] ACTIVITY NO. [23] TASK DESCRIPTION [24] DATE INITIATED

[25] REMARKS:

[27] DISTRIBUTION:
[28] CONST PROJECT MANAGER
EN DES PROJECT MANAGER
QAS
CEDC QA
NEB (for Significant NCR's)**
MEDS
NRRS (for Significant NCR's)

* DISTRIBUTE AFTER THIS SIGNATURE
** HANDCARRY COPY TO NEB-NLS

[26] ALL EN DES ACTION COMPLETE:
JAE
*BRANCH CHIEF/ORG. 4/2/84 DATE

CEB'84 0402 003

EN DES
NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

NCR NO. WANCER8232

SIGNIFICANT
YES ☐ NO ☒

REPORTABLE
YES ☐ NO ☒

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 ☒ No ☐ If yes, list in (C) below.

C. Documents related to the NCR (ECN, analyses, memos, contract No., etc.)

	REF OR MEDS ACCESS. NO.	STATUS WORKING (see (F) below)	STATUS COMPLETE
ECN 3511	WBP840321526		✓

D. 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 ☒ 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 ☐

H. Remarks:

Verified By Roger Griffith Date 3-26-84

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

CEB '82 1117 022

[1] REPORT NO. WBNCEB8233

[2] PLANT Watts Bar [3] UNIT 1

[4] PREPARER/ORGANIZATION/DATE C. C. Wagner/TPE-CEB-PAS2/11-9-82

[5] 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.

8402270150 (2)

[6] DATE OF OCCURRENCE EST (X), ACT. ( ) 1/80

[7] METHOD OF DISCOVERY Black & Veatch Review

[8] UNID CODE (EN DES-EP 8.01)

[9] SIGNIFICANT CONDITION ADVERSE TO QUALITY YES [X] NO [ ]

[10] *BRANCH CHIEF/DATE 11/17/82

[11] CORRECTIVE ACTION: GENCEB8302 was written to address an error in the anchor program. As a result of this generic NCR, all anchor loads on WBN will be rerun and documented. Therefore, the above-stated deficiency will have the anchors recalculated in accordance with the revised anchor program.

[12] CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES [ ] NO [ ]

[13] DESIGN CRITERIA DOCUMENT NO. EXCEPTION REQUEST NO.

[14] ECN REQUIRED [X] YES NO [ ] ECN NO. 3511 [15] SCHEDULE IMPACT [ ] P [ ] A [ ] N

16 ASSIGNABLE CAUSE: (REQUIRED IF SIGNIFICANT) Microfilming of the anchor program [illegible] a requirement of the analyst. As a result, calculations to support the anchor load cables were not always readily available.

17 THIS IS A GENERIC CONDITION YES ☐ NO ☐

18 ACTION REQUIRED TO PREVENT RECURRENCE: (REQUIRED IF SIGNIFICANT) All anchors on WBN will be recalculated and documented. The anchor program printouts will be microfilmed and filed according to the following criteria:

1. If both sides of the anchor are rigorously analyzed, the microfilmed anchor load printout will be filed with the analysis problem that was last reanalyzed.
2. If one side of the anchor is alternately analyzed and the other side is rigorously analyzed, the microfilmed anchor load printout will be filed with the rigorously analyzed side.
3. If one side of the anchor is CEB alternately analyzed and the other side is rigorously analyzed, anchor loads will be tabulated for both sides on separate tables. Documentation for the loads on that analysis are microfilmed and referenced in the respective problem. Documentation EN DES-EP 3.56 will have a section concerning the documentation and microfilming of anchor loads.

19 *QA ENGINEER REVIEW AND CONCURRENCE: JEMcCord 11/7/83 11/7/83

20 LABOR EST. ( ), ACT. ( ) MH | 21 SCHEDULE EST. ( ), ACT. ( ) DAYS

22 ACTIVITY NO. | 23 TASK DESCRIPTION | 24 DATE INITIATED

25 REMARKS:

This NCR is superceded by NCR WBNCEB8233 R1, MEDS accession number CEB 831229 009.

27 DISTRIBUTION:
28 CONST PROJECT MANAGER
EN DES PROJECT MANAGER
QAB
OEDC QA
NEB (for Significant NCR's)**
MEDS
NSRS (for Significant NCR's)

* DISTRIBUTE AFTER THIS SIGNATURE
** HANDCARRY COPY TO NEB-NLS

26 ALL EN DES ACTION COMPLETE: [signature] 2/9/84
JAC *BRANCH CHIEF/ORG. DATE

CEB 840209 008

850503E0038 (4)

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

MEDS Accession No. B41 850430 003

[1] REPORT NO. WBNSWP8252 R3

[2] PLANT WATTS BAR NUCLEAR PLANT	[3] UNIT 1 & 2
[4] PREPARER/ORGANIZATION/DATE N. F. Consumo/CEB/April 18, 1985	

[5a] 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 WBN 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
WBNCEB8218 - 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

(Continued on Attachment)

[5b] SYSTEM [5c] VENDOR NAME [5d] CONTRACT NO.

[6] DATE OF OCCURRENCE EST (X), ACT. ( ) 1-76	[9] SIGNIFICANT CONDITION ADVERSE TO QUALITY YES [X] NO [ ]
[7] METHOD OF DISCOVERY Design Review	[10] *BRANCH CHIEF/DATE
[8] UNID CODE (EN DES-EP 8.01) N/A	

[11a] 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 CEB 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 control 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)

[11b] SCHEDULED DATE OF COMPLETION: _____

[12] CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES [ ] NO [X]

[13] DESIGN CRITERIA DOCUMENT NO. EXCEPTION REQUEST NO.

[14] ECN REQUIRED [X] YES [ ] NO ECN NO. 3213, 3542 [15] SCHEDULE IMPACT [ ] P [X] A [ ] N

NONCONFORMANCE REPORT

[1] REPORT NO. WBNSWP8252 R3

[16] ASSIGNABLE CAUSE: (REQUIRED IF SIGNIFICANT)

The following items have been identified as causes of these deficiencies.

1. Failure to provide adequate analysis methods.
2. Failure to provide an analysis procedure.
3. Failure to adequately train personnel in alternate analysis methods.

[17] POTENTIAL GENERIC CONDITION REVIEW REQUIRED (EN DES-EP 1.52) YES [X] NO [ ]

[18a] ACTION REQUIRED TO PREVENT RECURRENCE: (REQUIRED IF SIGNIFICANT)

See attached sheet.

[18b] SCHEDULED DATE OF COMPLETION: _____

[19] *INDEPENDENT REVIEW: W. F. Scott 3/25/88

[20] LABOR EST. ( ), ACT. ( ) MH [21] SCHEDULE EST. ( ), ACT. ( ) DAYS

[22] ACTIVITY NO.	[23] TASK DESCRIPTION	[24] DATE INITIATED

[25] REMARKS

Revised corrective action and action required to prevent recurrence to indicate that most of the Unit 2 piping is being analyzed using simplified (T-pipe) computer analysis.

[27] DISTRIBUTION:

[28]
CONST PROJECT MANAGER
EN DES PROJECT MANAGER
CHIEF, ESB
OFFICE OF QA
MEDS CIS
EN DES MANAGER (for significant NCRs)
NEB (for Significant NCRs)**
NSRS (for Significant NCRs)

[26] ALL EN DES ACTION COMPLETE:

_____ _____
*BRANCH CHIEF/ORG. DATE

*DISTRIBUTE AFTER THIS SIGNATURE
** HANDCARRY COPY TO NEB-NLS

_____
MEDS ACCESSION NO.

ATTACHMENT

5a. DESCRIPTION OF CONDITION

NCR WBNSWP8252 R3

WBNSWP8306 - the scope of CEB 76-5
WBNSWP8311 - Use of CEB 76-5 to analyse schedule 10S stainless steel piping. This piping not within the scope of CEB 76-5
* Partially included in this NCR (last sentence only).

11. CORRECTIVE ACTION

NCR WBNSWP8252 R3

Unit 1

CEB 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 CEB 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 CEB 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 NCR. 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

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.

2. SWP EP 43.21 has been issued to control the analysis of alternately analyzed piping in WBP's scope. In the future CEB will not analyze WBN 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 CONST 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 WBN 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.

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

MEDS Accession No SWP '83 0224 026

[1] REPORT NO WBNSWP8302

[2] PLANT WATTS BAR NUCLEAR PLANT [3] UNIT 1

[4] PREPARER/ORGANIZATION/DATE Dennis W. Owen/SWP/February 22, 1983

[5] DESCRIPTION OF CONDITION

Auxiliary feedwater pipe support 1-03B-73 R903 does not allow for movement in the global "Z" direction as required by load table 47B427-500 R1. This condition was identified by Black & Veatch Finding F-3o4 (copy attached).

8403214F0255

(2)

[6] DATE OF OCCURRENCE ESTIMATED/ACTUAL 11/8/82

[7] METHOD OF DISCOVERY Black & Veatch Review

[8] UNID CODE (EN DES EP 8 01)

[9] SIGNIFICANT CONDITION ADVERSE TO QUALITY YES X NO

[10] *BRANCH CHIEF DATE [illegible] 2/23/83

[11] CORRECTIVE ACTION

N/A

[12] CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES NO

[13] DESIGN CRITERIA DOCUMENT NO EXCEPTION REQUEST NO

[14] ECN REQUIRED YES NO [15] SCHEDULE IMPACT YES NO

NONCONFORMANCE REPORT

[1] REPORT NO WBNSWP8202

[16] ASSIGNABLE CAUSE (REQUIRED IF SIGNIFICANT)

N/A

[17] THIS IS A GENERIC CONDITION YES ☐ NO ☐

[18] ACTION REQUIRED TO PREVENT RECURRENCE (REQUIRED IF SIGNIFICANT)

N/A

[19] *INDEPENDENT REVIEW

[20] LABOR EST ( ), ACT ( ) MH | [21] SCHEDULE EST ( ), ACT ( ) DAYS

[22] ACTIVITY NO | [23] TASK DESCRIPTION | [24] DATE INITIATED

[25] REMARKS This condition was prematurely identified as a nonconformance during the Black & Veatch review. Revision 903 of the associated hanger drawing showed a modification to allow for the "Z" direction movement required by load table 47B427-500 R1, but the physical modification of the hanger had not been completed by CONST at the time of the review. This information was noted in the disposition of Black & Veatch finding F-364.

[27] DISTRIBUTION
CONST PROJECT MANAGER D. W. Owen, 3117 GB-K
[28] 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

[26] ALL EN DES ACTION COMPLETE

*BRANCH CHIEF/ORG. — DATE 7/6/84

WBP '84 0206 012

MEDS ACCESSION NO.

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

MEDS Accession No SWP '83 0110 125

[1] REPORT NO WBNSWP8272

[2] PLANT Watts Bar Nuclear Plant | [3] UNIT 1

[4] PREPARER ORGANIZATION/DATE J. R. Holloway/S&P/January 10, 1983

[5] DESCRIPTION OF CONDITION

Support 03B-1AFW-R221 Rev 903 was not designed to the specified requirements of support loads table 47B427-469 R0. 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.

8404060066

[6] DATE OF OCCURRENCE EST (X), ACT ( ) 4/21/82

[7] METHOD OF DISCOVERY Black and Veatch Review

[8] UNID CODE (EN DES FP B 01) N/A

[9] SIGNIFICANT CONDITION ADVERSE TO QUALITY YES [X] NO [ ]

[10] BRANCH CHIEF/DATE [illegible] 1/10/83

[11] CORRECTIVE ACTION Support 03B-1AFW-R221 Rev 903 has been redesigned to allow the thermal movements in the X and Z directions required by load table 47B427-469 R0. Drawing issued 4-7-83.

[12] CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES [ ] NO [X]

[13] DESIGN CRITERIA DOCUMENT NO N/A EXCEPTION REQUEST NO N/A

[14] ECN REQUIRED [X] YES NO [ ] ECN NO 3511 | [15] SCHEDULE IMPACT [ ] P [ ] A [X] N

NONCONFORMANCE REPORT

[1] REPORT NO. WBNSWP8272

[16] ASSIGNABLE CAUSE (REQUIRED IF SIGNIFICANT)

Original designer inadvertantly neglected thermal movements in design of support. ~~This was an isolated incidence of individual error.~~ BK 3/14/84 Also, inadequate checking of the design work allowed the support to be released with errors.

[17] THIS IS A GENERIC CONDITION YES ☐ NO ☒

[18] ACTION REQUIRED TO PREVENT RECURRENCE (REQUIRED IF SIGNIFICANT)

Pipe support designers have been trained ~~since reorganization of September 1982~~ BKM 3/14/84 in the use of the Pipe Support Design Manual which has guidelines on how to allow for thermal movement. (See SWP 820714 011 for training roster.) Designers also received training in EN DES-EP 4.25 "Design Review and Interface Coordination of Detailed Construction and Procurement Drawings."

[19] *INDEPENDENT REVIEW R. D. Pratt 2/24/84

[20] LABOR EST. ( ), ACT ( ) N/A MH [21] SCHEDULE EST ( ), ACT ( ) N/A DAYS

[22] ACTIVITY NO. N/A [23] TASK DESCRIPTION N/A [24] DATE INITIATED N/A

[25] REMARKS.

Additional corrective action by CONST is being tracked by ECN 3511.

[27] DISTRIBUTION

[28] CONST PROJECT MANAGER J. R. Holloway, 3109 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 OEDC (Quality and Nuclear Safety)--for Significant NCRs
* DISTRIBUTE AFTER THIS SIGNATURE
** HANDCARRY COPY TO NEB-NLS

[26] ALL EN DES ACTION COMPLETE:

C A Chandley 3-28-84
*BRANCH CHIEF/ORG DATE

MEB '840328 012
MEDS ACCESSION NO.

EN DES
NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

NCR NO. WBNSWP8272

SIGNIFICANT
YES ☒ NO ☐

REPORTABLE
YES ☐ NO ☒

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 ☒ No ☐ If 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 3511	WBP840321525	3/21/84
PIPE SUPPORT DRAWING	038-1AFW-R221 R903	4/7/83
PIPE SUPPORT ANALYSIS	WBP 830822078	8/22/83

D. Is action by organization outside EN DES required? Yes ☒ No ☐
Organization tracking No. ECN 3511

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 ☒ No ☐

G. Remarks:

Verified By JJ Nark Date 7/26/84

TVA 10700A (EN DES--12/83)

A

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

MEDS Accession No. SWP '83 0111 035

[1] REPORT NO. WBNSWP8273

[2] PLANT WATTS BAR NUCLEAR PLANT	[3] UNIT 1&2
[4] PREPARER/ORGANIZATION/DATE R. L. Ilich/SWP/January 11, 1983	

[5] DESCRIPTION OF CONDITION

8312080489 (3)

Substitution of fillet welds as allowed by General Note 3 on TVA drawing 47A050-1T was found to be inadequate. The service load capacity of 1-1/4-inch wedge bolts, and anchors with equal or greater capacity exceed the capacity of a 5/16-inch fillet weld 2 inches long allowed by 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 47A050-1T.

[6] DATE OF OCCURRENCE EST (X), ACT. ( ) 8/4/81	[9] SIGNIFICANT CONDITION ADVERSE TO QUALITY YES [X] NO [ ]
[7] METHOD OF DISCOVERY Black & Veatch Review	
[8] UNID CODE (EN DES-EP 8.01) N/A	[10] *BRANCH CHIEF/DATE JC Stardle 1-11-83

[11] CORRECTIVE ACTION

EN DES has identified 10 systems of which there are 22 supports for Unit 1 and 9 supports for Unit 2 that have 1-1/4-inch or larger diameter wedge bolts or 1-inch or larger diameter grouted anchors that could be adverse conditions if the note was applied. These supports were identified to CONST (see memo WBP 830429 032) requesting them to verify whether the note had been used. If the note was used, CONST would provide the exact weld length and size.

CONST has completed its inspection (see memo WBN 830523 005) of all supports identified by EN DES. Of 22 supports for Unit 1 identified to CONST, the substitution of welds for anchor bolts was made on five supports. Review of the detailed calculations for these supports determined the installation is adequate. Of the supports for Unit 2 identified to CONST none are installed.

EN DES has also completed the evaluation of all typical supports and General Notes, and found no similar deviation of this note. There is no other note of this nature in the typical drawing series.

[12] CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES [ ] NO [X]	
[13] DESIGN CRITERIA DOCUMENT NO. N/A	EXCEPTION REQUEST NO N/A
[14] ECN REQUIRED [X] YES NO [ ] ECN NO 3988	[15] SCHEDULE IMPACT [ ] P [ ] A [X] N

NONCONFORMANCE REPORT

[1] REPORT NO. [redacted]

[16] 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.

[17] THIS IS A GENERIC CONDITION YES ☐ NO ☒

[18] ACTION REQUIRED TO PREVENT RECURRENCE (REQUIRED IF SIGNIFICANT)

To alleviate these conditions, EN DES has stopped the use of the note for bolts 1-inch diameter and larger. Drawing 47A050-1T 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.

[19] *INDEPENDENT REVIEW Brian Campbell 7/26/83

[20] LABOR EST (X), ACT ( ) 300 MH [21] SCHEDULE EST. (X), ACT ( ) 75 DAYS

[22] ACTIVITY NO. NCLT4P2 [23] TASK DESCRIPTION NCR Collector [24] DATE INITIATED 1-25-83

[25] REMARKS

[27] DISTRIBUTION
[28] CONST PROJECT MANAGER
EN DES PROJECT MANAGER
CHIEF, ESB
OFFICE OF QA
NEB (for Significant NCRs)**
MEDS CIS
NSRB (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

[26] ALL EN DES ACTION COMPLETE

J C Stauffer 12/5/83
BRANCH CHIEF/ORG. DATE

WBP 83 1205 137
MEDS ACCESSION NO.

EN DES
NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

NCR NO. WBN/SWP 8273

SIGNIFICANT
YES [X] NO [ ]

REPORTABLE
YES [X] NO [ ]

A. Have any analyses, contracts, memorandums, etc., requiring EN DES work been generated? Yes [X] No [ ] If yes, list in (C) below.

B. Have all ECNs related to the NCR been issued?
N/A [ ] Yes [X] No [ ] If yes, list in (C) below.

C. Documents related to the NCR (ECN, analyses, memos, contract No., etc.)

	REF OR MEDS ACCESS. NO.	STATUS WORKING (see (F) below)	STATUS COMPLETE
ECN 3988 (CLOSED) DATA SHEET # 1	WBP 890907058	—	YES
CALCULATION PACKAGE FOR NCR WBN/SWP 8273 EVALUATION	WBP 890810037	—	YES

D. Is action by organization outside EN DES required? Yes [ ] No [X]
Organization tracking No. (NCR, QCIR, etc.) NA

E. Has all necessary EN DES information been transmitted to an organization outside EN DES to enable the completion of work required?
Yes [X] No [ ] N/A [X] 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 [X] No [ ]

H. Remarks:

Verified By R. D. Pratt for Date 11/29/89

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

EN DES-EP 1.26
Attachment No. 1

MEDS Accession No. NEB 830126 851

[1] REPORT NO. GENNEB8301

[2] PLANT Sequoyah and Watts Bar Nuclear Plants | [3] UNITS 1 and 2

[4] PREPARER/ORGANIZATION/DATE B. K. Williams/EN DES-NEB/1-24-83

[5] DESCRIPTION OF CONDITION

SQN FSAR Question 5.28 and 5.28A state that backup to the condensate storage tank for the auxiliary feedwater system is from the fully qualified Seismic Category I ERCW system via fully qualified multiple automatic admission valves and "the eight transfer valves are Seismic Category I and the transfer system with associated controls meets the requirements of IEEE-279." Also Westinghouse Steam System Design Manual Section III-2 (R2) states "The whole of the auxiliary feedwater system (water supply, piping, pumps, power sources, etc.) must be "safety class" design standard." Contrary to references listed above PS-3-121A, B, and D are shown on dwg. 47W610-3-3 as receiving nondivisional power and have been verified as receiving nondivisional power.

8306240217 (2)

[6] DATE OF OCCURRENCE EST (X), ACT. ( ) 1973

[7] METHOD OF DISCOVERY Design Review

[8] UNID CODE (EN DES-EP 5.01) N/A

[9] SIGNIFICANT CONDITION ADVERSE TO QUALITY: YES [X] NO [ ]

[10] *BRANCH CHIEF/DATE John A. Scalice 1/26/83

[11] CORRECTIVE ACTION:

Provide a redundant circuit (components and cables) identical to the existing one and identify them as train "A" and "B," and align them with the train "A" and "B" valves in the automatic transfer scheme.

[12] CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES [ ] NO [X]

[13] DESIGN CRITERIA DOCUMENT NO. EXCEPTION REQUEST NO.

[14] SCN REQUIRED [X] YES NO [ ] SCN NO. [15] SCHEDULE IMPACT [ ] P [ ] A [ ] N

TVA 10700 (EN DES-12/82)

NONCONFORMANCE REPORT

[1] REPORT NO. GENNEB8301

[16] ASSIGNABLE CAUSE: (REQUIRED IF SIGNIFICANT)

EN DES failed to comply to IEEE-279 sec. 4.6 and sec. 4.22. The routing of the cables [illegible]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 YES [X] NO [ ]

[18] 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.

[19] *INDEPENDENT REVIEW: ~~M.R.B. 6/14/83~~ M R Beleu 6/14/83

[20] LABOR EST. ( ), ACT. ( ) MH [21] SCHEDULE EST. ( ), ACT. ( ) DAYS

[22] ACTIVITY NO.	[23] TASK DESCRIPTION	[24] DATE INITIATED

[25] REMARKS 1. Referred to MEB for handling (NEB 83 03 31 257).
2. Referred to EEB for handling February 18, 1983.

LRR
MRC

[27] DISTRIBUTION:
[28]
CONST PROJECT MANAGER
EN DES PROJECT MANAGER
CHIEF, ESB
OFFICE OF QA
*EEB (for Significant NCRs)** ✓
MEDS CIS
NEB (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

[28] ALL EN DES ACTION COMPLETE:

*BRANCH CHIEF/ORG. DATE

MEDS ACCESSION NO.

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

SWP '83 0114 017

MEDS Accession No. SWP '83 0110 126

S33120E0532 (2)

[1] REPORT NO. WBNSWP8301

[2] PLANT Watts Bar Nuclear Plant	[3] UNIT 1
[4] PREPARER/ORGANIZATION/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 [ ]
[7] METHOD OF DISCOVERY Black & Veatch Review	
[8] UNID CODE (EN DES-EP 8.01) N/A	[10] *BRANCH CHIEF/DATE EHCole 1/10/83

[11] CORRECTIVE ACTION

[12] CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES [ ] NO [ ]

[13] DESIGN CRITERIA DOCUMENT NO. EXCEPTION REQUEST NO.

[14] ECN REQUIRED [ ] YES [ ] NO [ ] ECN NO.

[15] SCHEDULE IMPACT [ ] P [ ] A [ ] N

NONCONFORMANCE REPORT

[1] REPORT NO. WBNSWP8301

[16] ASSIGNABLE CAUSE (REQUIRED IF SIGNIFICANT)

[17] THIS IS A GENERIC CONDITION YES ☐ NO ☐

[18] ACTION REQUIRED TO PREVENT RECURRENCE: (REQUIRED IF SIGNIFICANT)

[19] *INDEPENDENT REVIEW:

[20] LABOR EST. ( ), ACT. ( ) MH [21] SCHEDULE EST. ( ), ACT. ( ) DAYS

[22] ACTIVITY NO.	[23] TASK DESCRIPTION	[24] DATE INITIATED

[25] REMARKS:

This NCR is superseded by NCR WBNSWP8301 R1 (SWP 830111 034).

[27] DISTRIBUTION:
CONST PROJECT MANAGER R. L. Ilich
[28] 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

[26] ALL EN DES ACTION COMPLETE:

D C Standifer 1-14-83
*BRANCH CHIEF/ORG. DATE

SWP 83 0114 017
MEDS ACCESSION NO.

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

MEDS Accession No. CEB 830323 011

830613F0364

[1] REPORT NO. CENCEB8302

[2] PLANT All Plants (BFN,SQN,WBN,BLN) [3] UNIT All Units

[4] PREPARER/ORGANIZATION/DATE D. W. Hargroves/EN DES-CEB/3-17-83

[5] DESCRIPTION OF CONDITION

Specific cases have been discovered, using the direction cosines options in the program -ANCHORS, which do not produce hand-verifiable results which correlate with the inputs specified in the users manual.

[6] DATE OF OCCURRENCE EST (3), ACT. ( ) 1976

[7] METHOD OF DISCOVERY

[8] UNID CODE (EN DES-EP 8.01)

[9] SIGNIFICANT CONDITION ADVERSE TO QUALITY YES [X] NO [ ]

[10] *BRANCH CHIEF/DATE 3/24/83

[11] CORRECTIVE ACTION:

[12] CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES [ ] NO [ ]

[13] DESIGN CRITERIA DOCUMENT NO. EXCEPTION REQUEST NO.

[14] ECN REQUIRED [ ] YES NO [ ] ECN No.

[15] SCHEDULE IMPACT [ ] P [ ] A [ ] N

NONCONFORMANCE REPORT

[1] REPORT NO. GENCEB8302

[16] ASSIGNABLE CAUSE: (REQUIRED IF SIGNIFICANT)

[17] THIS IS A GENERIC CONDITION YES ☐ NO ☐

[18] ACTION REQUIRED TO PREVENT RECURRENCE: (REQUIRED IF SIGNIFICANT)

[19] *INDEPENDENT REVIEW:

[20] LABOR EST. ( ), ACT. ( ) MH | [21] SCHEDULE EST. ( ), ACT. ( ) DAYS

[22] ACTIVITY NO. | [23] TASK DESCRIPTION | [24] DATE INITIATED

[25] REMARKS:

The NCR is superceded by GENCEB8302 R1, MEDS Accession Number CEB 830608 010.

[27] DISTRIBUTION:
CONST PROJECT MANAGER
[28] EN DES PROJECT MANAGER
CHIEF, ESB
OFFICE OF QA
NSB (for Significant NCRs)**
MEDS CIS
NSRB (for Significant NCRs)*
ASSISTANT TO THE MANAGER OF OEDC (Quality and Nuclear Safety)-for Significant NCRs
* DISTRIBUTE AFTER THIS SIGNATURE
** HANDCARRY COPY TO NSB-NLS

[28] ALL EN DES ACTION COMPLETE:

L O Barnett 6/9/83

*BRANCH CHIEF/ORG. DATE

CEB 330609 018

MEDS ACCESSION NO.

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

MEDS Accession No. SWP 830110 124

[1] REPORT NO. WBNSWP8305

[2] PLANT WATTS BAR NUCLEAR PLANT | [3] UNIT 1

[4] PREPARER/ORGANIZATION/DATE R. L. Ilich/SWP/January 10, 1983

[5] DESCRIPTION OF CONDITION

The design for support 03B-1AFW-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 F775.

8404 20E0249 (10)

[6] DATE OF OCCURRENCE EST (X) ACT ( ) December 1978

[9] SIGNIFICANT CONDITION ADVERSE TO QUALITY YES [X] NO [ ]

METHOD OF DISCOVERY Black & Veatch Review

[8] UNID CODE (EN DES-EP 8.01) N/A

[10] *BRANCH CHIEF/DATE E H Ch 1/10/83

[11] CORRECTIVE ACTION

Support 03B-1AFW-R188 was modifed under ECN 3511 to remove the nonconforming condition. The majority of the supports on the auxiliary feedwater system have been reviewed in the last six months by TVA for reanalysis reasons. No other unstable structures have been found and we consider this to be a unique occurence.

[12] CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES [ ] NO [X]

[13] DESIGN CRITERIA DOCUMENT NO. N/A EXCEPTION REQUEST NO N/A

[14] ECN REQUIRED [X] YES NO [ ] ECN NO 3511 [15] SCHEDULE IMPACT [ ] P [ ] A [X] N

NONCONFORMANCE REPORT

[1] REPORT NO. WBNSWP8305

[1b] ASSIGNABLE CAUSE (REQUIRED IF SIGNIFICANT)

The way the U-bolt and support components were designed in this support resulted in an unstable structure. This condition was due to inadequate design and checking of the functional capability of the structure.

[17] THIS IS A GENERIC CONDITION YES ☐ NO [X]

[18] ACTION REQUIRED TO PREVENT RECURRENCE (REQUIRED IF SIGNIFICANT)

This support was designed by Bergen-Patterson and later taken over by TVA. The subsequent reviews for reanalysis have shown no recurrence. No further action is required.

[19] *INDEPENDENT REVIEW. M. B. Maxwell MEO

[20] LABOR EST. ( ), ACT. ( ) N/A MH [21] SCHEDULE EST ( ), ACT. ( ) N/A DAYS

[22] ACTIVITY NO. N/A [23] TASK DESCRIPTION N/A [24] DATE INITIATED N/A

[25] REMARKS

Additional corrective action by CONST is being tracked by ECN 3511

[27] DISTRIBUTION:
CONST PROJECT MANAGER R. L. Ilich, 375 GB-K
[28] 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

[26] ALL EN DES ACTION COMPLETE

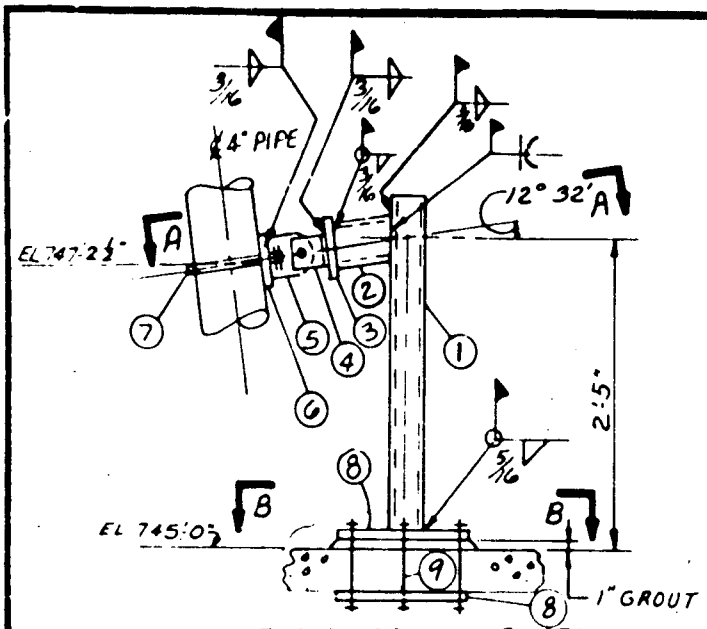
C A Chandley 9-6-84
*BRANCH CHIEF/ORG. DATE

NEB 840409 015
MEDS ACCESSION NO.

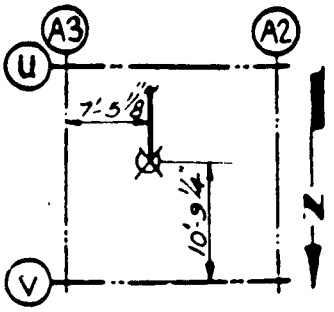
RO
14855

15047 P1

20 CALCS WBP 83 0728032

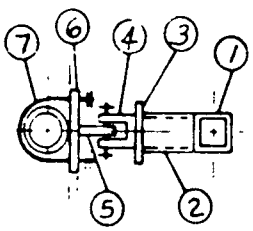


ELEV. LOOKING SOUTH

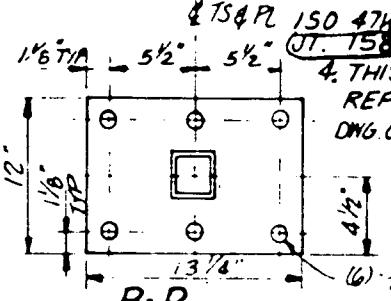


LOCATION PLAN
FL EL. 745'-0"

NOTES:
1. FOR GENERAL NOTES SEE 47A427-1
2. DESIGN LOADS
Fx = +954 #
-913 #
3. PROB NO N3-3-13A
TS & PL ISO 47W427-207 R9
JT. 158, TYPE RP(X)
4. THIS DWG REPLACES B-P DWG 038-1AFW-R188.



A-A



B-B

INITIAL ISSUE PER ECN 3511

ITEM	QTY	MATERIAL DESCRIPTION FOR ONE SUPPORT — No. SUPPORTS =
9	6	5/8" ø THREADED ROD x LGTH AS REQ'D W/2 HEX NUTS
8	2	℄ 1 x 12" x 1'-1¼"
7	1	B-P PART 6502, PIPE SIZE 4" ø (U-BOLT)
6	1	℄ ½ x 3 x 0'-9"
5	1	B-P PART 1052, ROD SIZE 5/8 (WELDING LUG)
4	1	BP PART 1047, ROD SIZE 5/8, CONFIGURATION TYPE 2 (WELDED BM ATTACH)
3	1	℄ ½ x 5 x 0'-5"
2	1	TS 4x4x½ x LG AS REQ'D
1	1	TS 4x4x½ x LG AS REQ'D

SEISMIC CATEGORY I STRUCTURES

MECHANICAL - UNIT 1
CATEGORY I SUPPORT FOR
SUPPORT DETAIL 4-5

WATTS BAR NUCLEAR PLANT
TENNESSEE VALLEY AUTHORITY

1 S1 REV. PER FCR H-10,717 (CALL MEOS WBP860203033)

R1

ITEM	QUAN.	PART NO.	MFR	DESCRIPTION		
1G	2	8200		1.5 - 2'-9" - R.S.S.A		
2G	8	2M3-6S		END ATTACHMENT		
3G	2	—		4 C5.4 x 3'-6" LG bb @ 1"	(A36)	B1TVA
4G	2	—		3 x 3/8" R x 3" LG.	(A36)	B1TVA
5G	2	260		5 WASHER PLATE		
6G	1	CS		4" x 3/8" R x 4" LG	(A36)	3
7	1					3
8G	1	283A		4" PIPE SIZE U-BOLT, A=5" ø, D=1'-4"		
9G	8	—		1/2 ø x 1 1/4" LG. BOLT.		B1TVA
10G	2	— ●		8" x 1/2" R x 8" LG W/(4) 5/8" ø HOLES.		B1TVA
11G	8	—		1/2" CONCRETE FASTENER (PHILLIPS REDHEAD)		B1TVA

SEE TVA DWG. NO. 47A050-1 & 1A

▲ A106 GR.B

● A36

954#

913#

ISO. 47W427-207-R1

JOINT: 157

DIRECTION: X

TYPE: RR

+ 954#

DESIGN LOAD:

− 913#

3'-10½"

2'-10¾"±

5¾" 4.0"±

DO NOT WELD

TYP 3/16

TYP 3/16

TYP 3/16

1/4

5¼"

2'-6"

2'-6"

2'-

7'-5"

10'-9¼"

11'-7"

Reason UNSTABLE STRUCTURE

Superseded By 47A427-4-5

Supervisor _____ Date 4/13

PLAN

LOCATION PLAN

REV PER ECN, NCR WBNSWP 830 & 80V F-775

REV PER FCR H-7785. CALC. MEDS SWP 830/21062

PROJECT WBNP CONTRACT 74C38-83015

DRAWING # 03B-1AFW-R188 NUCLEAR

SHEET 1/2 REV 904 UNIT 1 T.V.A. CLASS B

DRAVO ISO #E-2879-1C-11

DRAVO CORPORATION P.O. # E-2879-

T.V.A. CONTRACT # 74C38-83015

WATTS BAR NUCLEAR PLANT - UNIT # 1

TVA 90D = VENDOR RO

BERGEN-PATERSON PIPESUPPORT CORP.

PIPING SYSTEM: AUXILIARY FEEDWATER

DWG. PIPING: 47W427-4-8 STRUCTURAL: 41N318-2-5

JOB NO. 3604 P&S NO. 02

BASIC DWG. NO. 03B-1AFW-R188

DES MS DRN MS CHK HE APP SM DATE 4-22-77

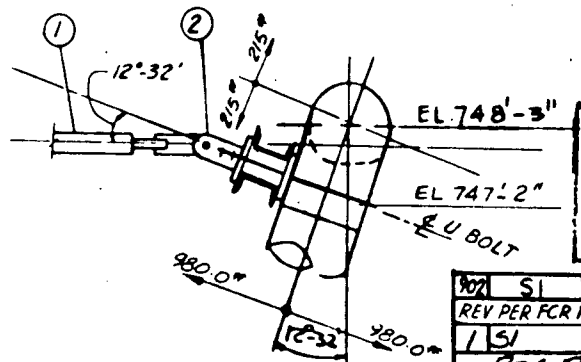
ITEM	QUAN.	PART NO.	SIZE	DESCRIPTION	WGT.
-	1	SDE	(4) HRS		
-	1	SDD			
-	1	SB			
-	1	E2P	210-3 FOR STRUT ITEM #1 (PIN TO PIN)		
-	1	BST			

TICKET 2129 A-402

INVOICE CODE

NOTE:
1. THIS SUPPORT RESTRAINT HAS TO BE WORKED WITH SUPPORT 03B-1AFW-R187

VOID
Reason UNSTABLE STRUCTURE
Voided By 47A427-4-5

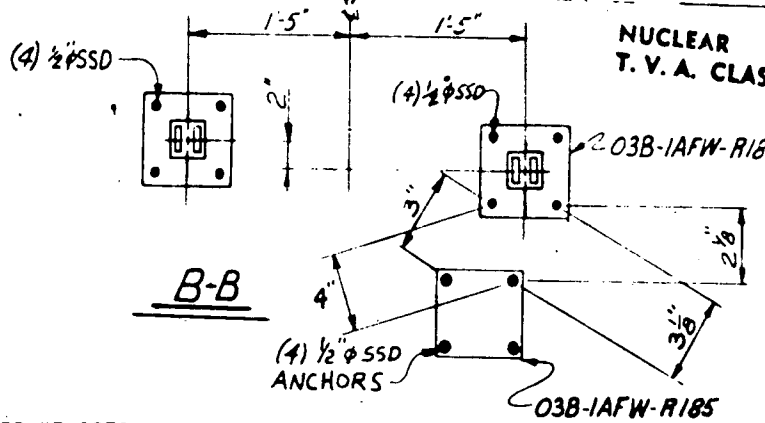


SECT. A-A

NO.	BY	DATE	REVISION
902	SI	[illegible]	REV PER FCR M-7785. CALC, MEDS SWP 830121002
1	SI	4/77	REV PER FCR M-4152

PROJECT WBNP CONTRACT 74C38-83015
03B-1AFW-R188
2/2 904 UNIT 1

NUCLEAR
T. V. A. CLASS B



B-B

DRAVO ISO #E-2879-IC-11 TVA 900 - VENDOR RO

DRAVO CORPORATION P O # E 2879
T V A CONTRACT # 74C38-83015
WATTS BAR NUCLEAR PLANT UNIT # 1

BERGEN-PATERSON PIPESUPPORT CORP.

PIPING SYSTEM	AUXILIARY FEEDWATER
DWG. NO. PIPING	47W427-4-8
DWG. NO. STRUCTURAL	41N318-2-5
JOB NO.	3604
PAS NO.	09
BASIC & DWG. NO.	03B-1AFW-R188
SHEET	2 of 2
REV	904

REV	DATE	BY	CHK'D	APP'D
902	3511	VOID DWG		
903	3611	RFV PER ECN, NCR WONSWP8305 & BAV F775		

DES MS DRN MS CHK AE APP SM DATE 4-22-77

ITEM	QUAN.	PART NO.	SIZE / DESCRIPTION	WGT			
1	2	2200	15 - 2'- 9" - R.S.S.A				
2	2		END ATTACHMENT				
3	2	—	4 C5.4 × 3'-6" LG b-b = 1" (A36)	BYTVA			
4	2	—	3 × 3/8" ℞ × 3" LG. (A36)	BYTVA			
5	2	260	5 WASHER PLATE				
6	1	C5	4" × 3/8" ℞ × 4" LG (A36)	3			
7	1			3			
8	1	083A	4" PIPE SIZE U-BOLT, A-36, D=1-4				
9	8	—	1/2 ⌀ × 1 1/4" LG. BOLT.	BYTVA			
10	2	— ●	8" × 1/2 ℞ × 8" LG W/(4) 15/16" ⌀ HOLES.	BYTVA			
11	8	—	1/2" CONCRETE FASTENER (PHILLIPS REDHEAD)	BYTVA			

SEE TVA DWG. NO. 47A050-1 & 1A

▲ A106 GR. B

● A36

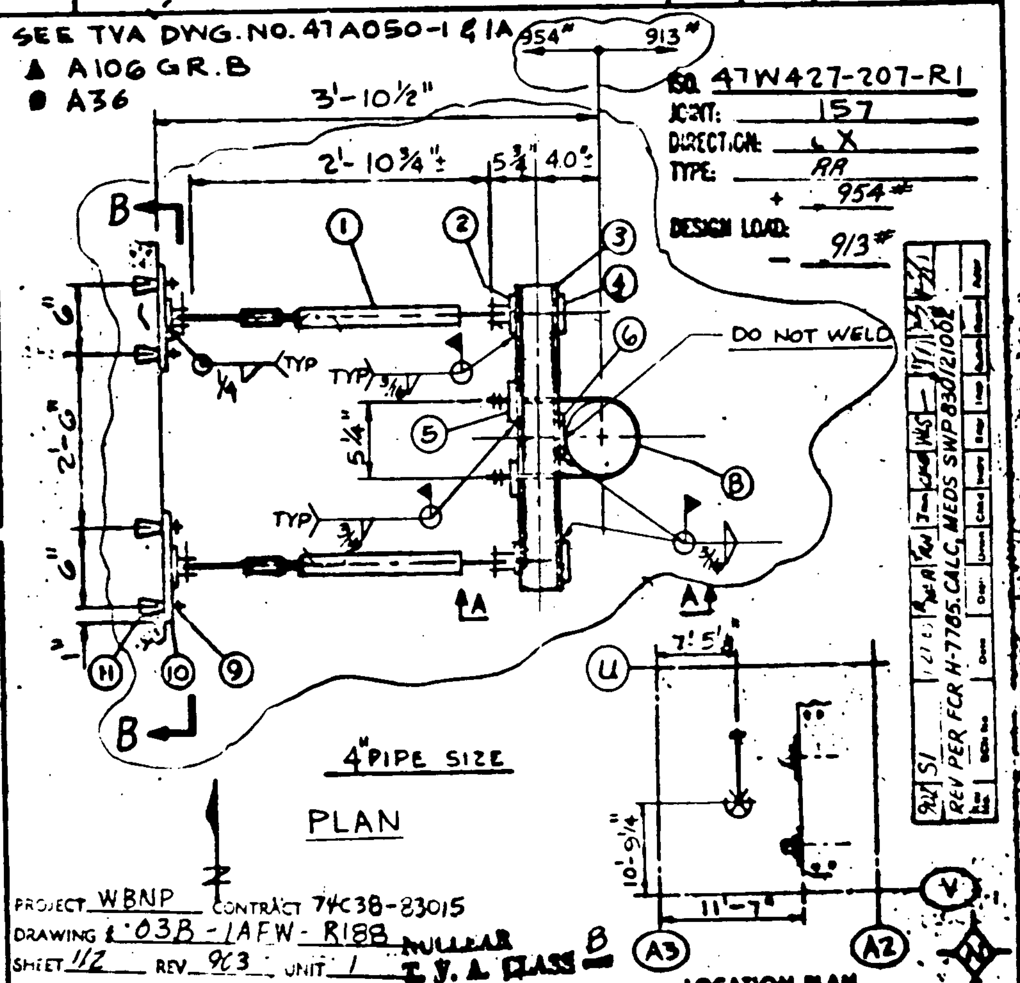
ISO 47W427-207-R1

JOINT: 157

DIRECTION: ↓ X

TYPE: RR

DESIGN LOAD: + 954# − 913#



PROJECT WBNP CONTRACT 74C38-83015

DRAWING # 03B-1AFW-R188 NUCLEAR

SHEET 1/2 REV 9C3 UNIT 1 T.V.A. CLASS B

REV PER ECN, NCR WBNSWP 8305 & BOV F-775

REV PER FCR H-7785, CALC MEDS SWP 830121002

DRAVO ISO #E-2879-1C-11

DRAVO CORPORATION P.O. # E-2879-

T.V.A. CONTRACT # 74C38-83015

WATTS BAR NUCLEAR PLANT - UNIT #1

TVA 900 = VENDOR R0

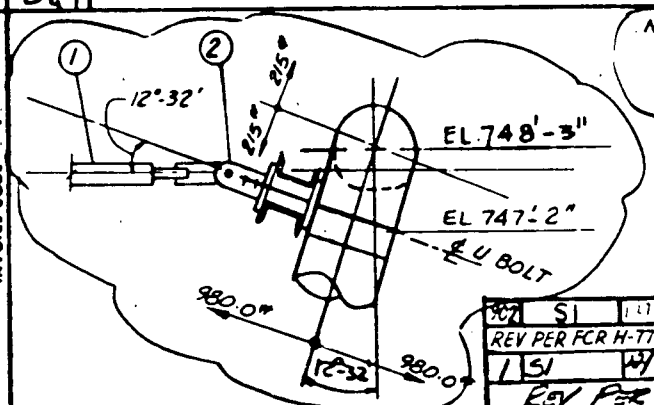
BERGEN-PATERSON PIPESUPPORT CORP.	
PIPING SYSTEM	AUXILIARY FEEDWATER
ELE. DWGS. PIPING	47W427-4-B
STRUCTURAL	41N318-2-5
JOB NO.	3604
DWG. NO.	03B-1AFW-R188
REV.	903
DATE	4-22-77
BY / CHK	MS / MS / AE / SM

ITEM	QUAN.	PART NO.	SIZE	DESCRIPTION	WGT.
-	1	SDE	(4) HRS		
-	1	SDD			
-	1	SB			
-	1	E2P	210-3 FOR STRUT ITEM #1 (PIN TO PIN)		
-	1	BOLT			

TWIST 2 1/2°

A-902

NOTE:
1. THIS SUPPORT RESTRAINT HAS TO BE WORKED WITH SUPPORT 03B-1AFW-R187

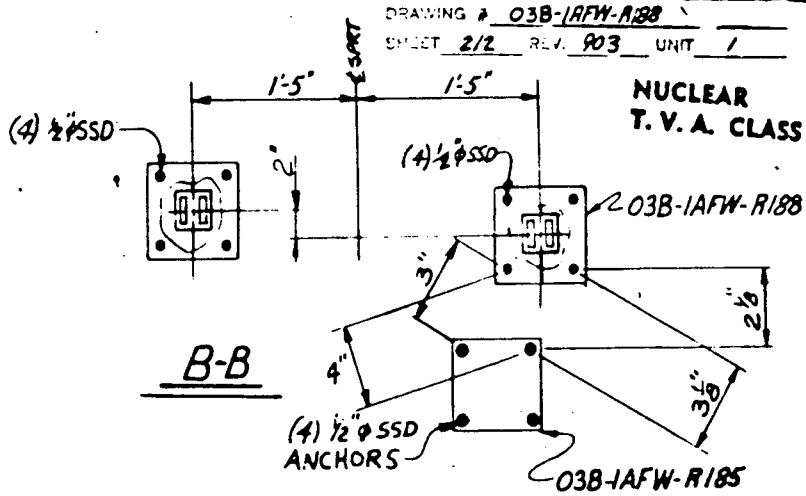


SECT. A-A

MOD.	SI									
REV PER FCR H-7785. CALC, MEDS SHT 830121002										
1	SI									
REV PER FCR M-4152										

REV NO.	ECN No.	Date	Design	Drawn	Check	Supv	Engr	Mech Engr	Mech Engr Supv	Appd

PROJECT WBNP CONTRACT 74C38-83015
DRAWING # 03B-1AFW-R188
SHEET 2/2 REV. 903 UNIT 1



NUCLEAR
T. V. A. CLASS B

DRAVO ISO #E-2879-IC-11 TVA 900 • VENDOR RO

DRAVO CORPORATION P O. # E 2879
T V A CONTRACT #74C38-83015
WATTS BAR NUCLEAR PLANT UNIT # 1

BERGEN-PATERSON PIPESUPPORT CORP.

PIPING SYSTEM: AUXILIARY FEEDWATER
DWG. PIPING: 47W427-4-8 STRUCTURAL: 41N318-2-5
JOB NO. 3604 PAGE NO. 09
DWG. & DWG. NO. 03B-1AFW-R188 SHEET 2 of 2 REV 903

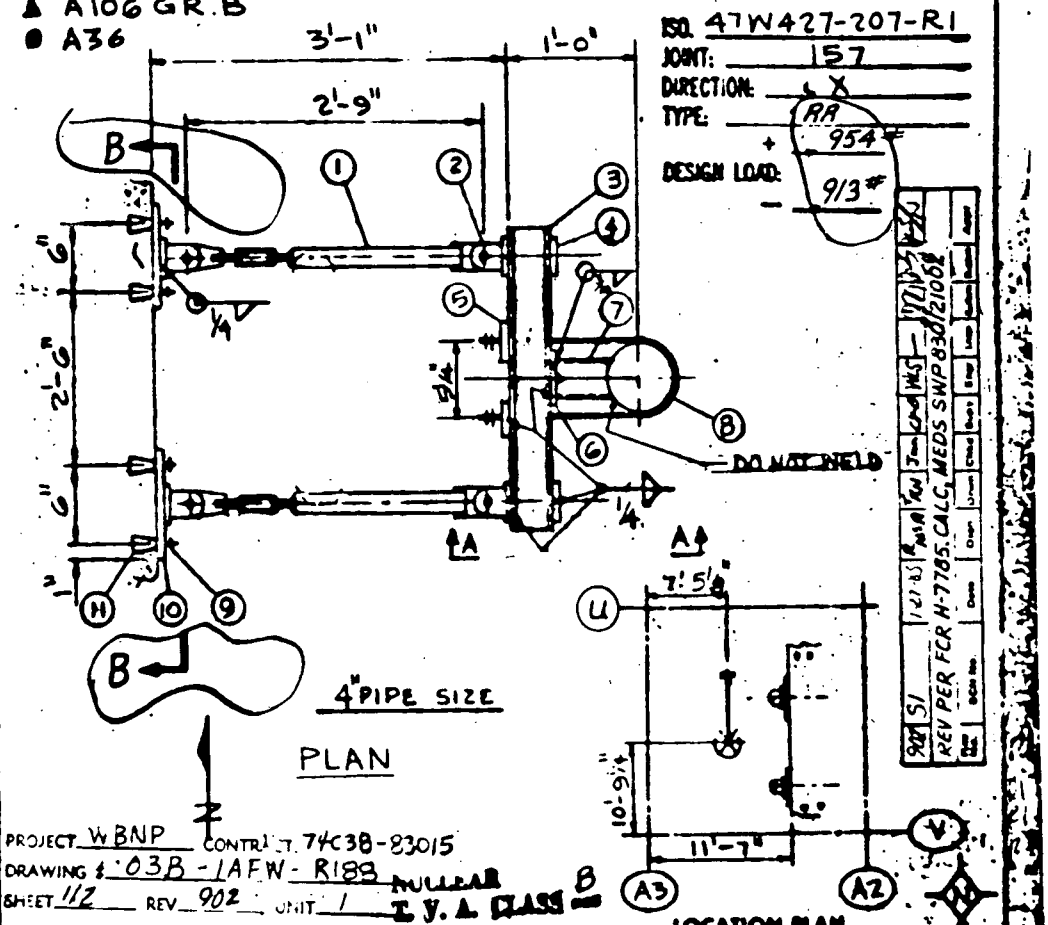
REV	DES	DATE	DES	CHK	APP
B11 REV PER ECN, NCR WBNSWP8305 & BOV F-775	MS	4-22-77	MS	AE	SH

ITEM	QUAN	PART NO	SIZE	DESCRIPTION	MATL				
1	2	2200	1.5 - 2'-9" - R.S.S.A.						
2	2	2003-69	END ATTACHMENT						
3	2	—	4	C5.4 x 3'-6" LG. b.b = 1"	(A36)	B1TVA			
4	2	—	3 x 3/8" R x 3" LG.		(A36)	B1TVA			
5	2	260	5 WASHER PLATE						
6	1	CS	4" x 3/8" R x 4" LG.		(A36)	3			
7	1	CS▲	2 1/2" ø SCH/STD x 5 5/8" LG PIPE (CUT AS SHOWN)			3			
8	1	283A	4" PIPE SIZE U-BOLT, A=3 5/8" ø, D=1'-4"						
9	8	—	1/2 ø x 1 1/4" LG. BOLT.			B1TVA			
10	2	—●	8" x 1/2" R x 8" LG. W/(4) 5/8" ø HOLES.			B1TVA			
11	8	—	1/2" CONCRETE FASTENER (PHILLIPS REDHEAD)			B1TVA			

SEE TVA DWG. NO. 47A050-1 & 1A

▲ A106 GR. B

● A36



ISO. 47W427-207-R1
JOINT: 157
DIRECTION: X
TYPE: AA
DESIGN LOAD: + 954# / − 913#

REV PER FCR M-7785. CALC. MEDS SWP 830121061

PROJECT WBNP CONTRACT 74C38-83015
DRAWING # 03B-1AFW-R188
SHEET 1/2 REV 902 UNIT 1
NUCLEAR T.V.A. CLASS B

TRAVO ISO #E-2879-1C-11

TRAVO CORPORATION P.O. # E-2879-
T.V.A. CONTRACT # 74C38-83015
WATTS BAR NUCLEAR PLANT - UNIT # 1
TVA RO = VENDOR RO

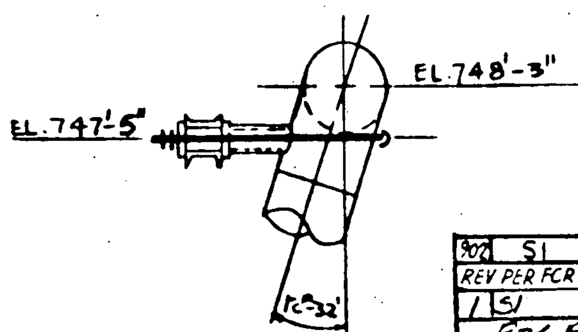
BERGEN-PATERSON PIPESUPPORT CORP.
AUXILIARY FEEDWATER
DWG. 47W427-4-8 STRUCTURAL 41N318-2-5
JOB NO. 3604 PAR NO. 09
DWG. NO. 03B-1AFW-R188 REV. 902

REV 1 SV DATE 4-22-77 BY MS CHK'D MS APP'D ME

FORM BP-8 10/76

TICKET 212 R902

ITEM	QUAN	PART NO.	SIZE	DESCRIPTION	WGT.			
–	1	SDE	(4) HRS					
–	1	SDD						
–	1	SB						
–	1	E2P	210-3 FOR STRUT ITEM #1 (PIN TO PIN)					
–	1	BKT						



SECT. A-A

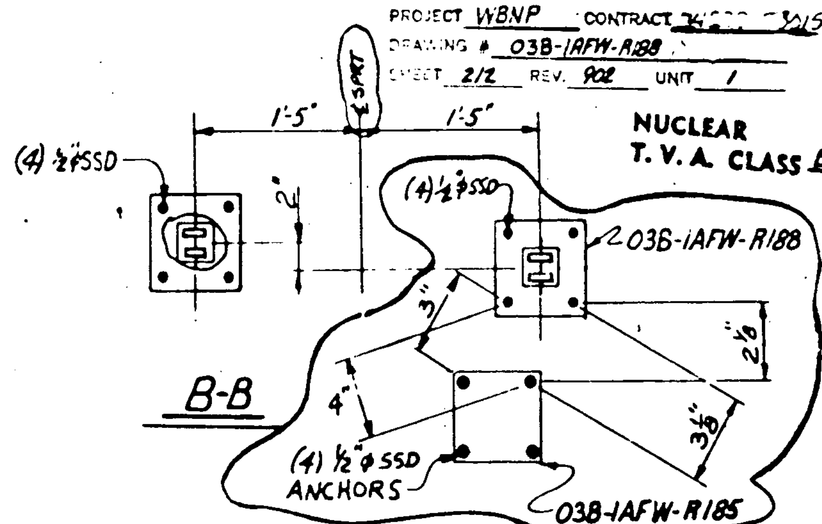
902	S1		TRN	JM		MLS	-				
REV PER FCR H-7785. CALC, MEDS SNP 830121002											
1	S1	12/78					-				
REV PER FCR M-4152											
Rev. No.	ECN No.	Date	Dsgn	Drwn	Chkd	Supv	Engr				

PROJECT WBNP CONTRACT [illegible]

DRAWING # 03B-1AFW-R188

SHEET 2/2 REV. 902 UNIT 1

NUCLEAR
T. V. A. CLASS B



B-B

DRAVO ISO #E-2879-IC-11 TVA RO - VENDOR RO

DRAVO CORPORATION P.O. # E 2879

T V A CONTRACT #74C38-83015

WATTS BAR NUCLEAR PLANT UNIT #1

BERGEN-PATERSON PIPESUPPORT CORP.

SYSTEM AUXILIARY FEEDWATER

REF. DWGS. PIPING 47W427-4-8 STRUCTURAL 41N318-2-5

JOB NO. 3604 PAS NO. 09

MARK & DWG. NO. 03B-1AFW-R188 SHEET 2 of 2 REV 902

REV — MS — MS — KE — SM — DATE 4-22-77

EN DES
NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

NCR NO. WBNSWP8305

SIGNIFICANT
YES ☒ NO ☐

REPORTABLE
YES ☐ NO ☒

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 ☒ No ☐ If yes, list in (C) below.

C. Documents related to the NCR (ECN, analyses, memos, contract No., etc.)

	REF OR MEDS ACCESS. NO.	COMPLETION DATE
SUPPORT DRAWING	038-1AFW-R1TTR904	8/10/83
SUPPORT CALCS	WBP 830421 018	4/21/83
ECN 3511 CLOSURE SHEET	WBP 840321526	3/21/84

D. Is action by organization outside EN DES required? Yes ☒ No ☐
Organizatio tracking No. ECN 3511

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 ☒ No ☐

G. Remarks:

Verified By Robert L. Slick Date 4/2/84

TVA 10700A (EN DES--12/83)

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

MEDS Accession No. SWP '83 0125 178

[1] REPORT NO. WBNSWP8309

[2] PLANT WATTS BAR NUCLEAR PLANT | [3] UNIT 1

[4] PREPARER/ORGANIZATION/DATE R. L. Ilich/SWP/January 25, 1983

[5] DESCRIPTION OF CONDITION

Box anchors 47A060-3-8 and 47A060-3-10 fail to meet the stiffness requirements for the force in the z-direction as required by Design Criteria WB-DC-40-31.15, section 7.1.4. Revision 1 of 47A060-3-8 allows 25.8 percent 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, to be transferred through the anchor to the other side. Section 7.1.4 of the design criteria limits a load transferred through anchor to 10 percent.

840420E0248 (3)

[6] DATE OF OCCURRENCE EST (X) ACT ( ) 12/8/80 | [9] SIGNIFICANT CONDITION ADVERSE TO QUALITY YES [X] NO [ ]

METHOD OF DISCOVERY Black & Veatch Findings F-319 & F-324

[8] UNID CODE (EN DES EP 8 01) 47 | [10] *BRANCH CHIEF DATE JC Stardy 1-25-83

[11] CORRECTIVE ACTION

Box anchors 47A060-3-8 and 47A060-3-10 were redesigned under ECN 3511 to meet the stiffness requirements of design criteria WB-DC-40-31.15, section 7.1.4.

[12] CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES [ ] NO [X]

[13] DESIGN CRITERIA DOCUMENT NO. N/A EXCEPTION REQUEST NO. N/A

[14] ECN REQUIRED [X] YES [ ] NO 3511 | [15] SCHEDULE IMPACT [ ] P [ ] A [X] N

NONCONFORMANCE REPORT

[1] REPORT NO WBNSWP8309

[16] ASSIGNABLE CAUSE (REQUIRED IF SIGNIFICANT)

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.

[17] THIS IS A GENERIC CONDITION YES ☐ NO ☒

[18] 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.

[19] *INDEPENDENT REVIEW M. L. Maxwell 4-6-84

[20] LABOR EST ( ), ACT ( ) N/A MH [21] SCHEDULE EST ( ), ACT ( ) N/A DAYS

[22] ACTIVITY NO. N/A [23] TASK DESCRIPTION N/A [24] DATE INITIATED N/A

[25] REMARKS

Additional corrective action by CONST is being tracked by ECN 3511.

[27] DISTRIBUTION
CONST PROJECT MANAGER R. L. Ilich, 375 GB-K
[28] 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

[26] ALL EN DES ACTION COMPLETE

C A Chandler 4-6-84
*BRANCH CHIEF/ORG. DATE

MEB 840409 016
MEDS ACCESSION NO.

EN DES
NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

NCR NO. WBNSWP8309

SIGNIFICANT YES ☒ NO ☐ REPORTABLE YES ☐ NO ☒

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 ☒ No ☐ If yes, list in (C) below.

C. Documents related to the NCR (ECN, analyses, memos, contract No., etc.)

	REF OR MEDS ACCESS. NO.	COMPLETION DATE
ANCHOR DRAWING	47A060-3-8 R2	8/10/83
47A060-3-8 ANCHOR CALCS	WBP840123050	1/23/84
ANCHOR DRAWING	47A060-3-10 R3	8/10/83
47A060-3-10 ANCHOR CALCS	WBP840123017	1/23/84
REQUIREMENTS NOTIFICATION MEMO	WBP840213021	2/13/84
ECN 3511 CLOSURE SHEET	WBP840321526	3/21/84

D. Is action by organization outside EN DES required? Yes ☒ No ☐
Organization tracking No. ECN 3511

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 ☒ No ☐

G. Remarks:

Verified By Robert L. Illick Date 4/2/84

TVA 10700A (EN DES--12/83)

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

MEDS Accession No. SWP 83 0209 047

[1] REPORT NO. WBNSWP8312

[2] PLANT WATTS BAR NUCLEAR PLANT [3] UNIT 1

[4] PREPARER/ORGANIZATION/DATE J. R. Holloway/SWP/February 9, 1983

[5] 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 (lbs 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 (3)

[6] DATE OF OCCURRENCE EST (X) ACT ( ) 12/10/80

[7] METHOD OF DISCOVERY Black & Veatch Rev (F-325)

[8] UNID CODE (EN DES-EP 8 01) N/A

[9] SIGNIFICANT CONDITION ADVERSE TO QUALITY YES ☐ NO ☒

[10] *BRANCH CHIEF/DATE JC Stardifer 2/9/83

[11] CORRECTIVE ACTION
Calculations were redone using correct applied forces. No further action is necessary.

[12] CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES ☐ NO ☒

[13] DESIGN CRITERIA DOCUMENT NO EXCEPTION REQUEST NO

[14] ECN REQUIRED ☐ YES NO ☒ (ECN NO.)

[15] SCHEDULE IMPACT ☐ P ☐ A ☒ N

NONCONFORMANCE REPORT

[1] REPORT NO. WBNSWP8312

[16] ASSIGNABLE CAUSE (REQUIRED IF SIGNIFICANT)

N/A

[17] THIS IS A GENERIC CONDITION YES ☐ NO ☒

[18] ACTION REQUIRED TO PREVENT RECURRENCE (REQUIRED IF SIGNIFICANT)

N/A

[19] *INDEPENDENT REVIEW R. D. Pratt 1/5/84

[20] LABOR EST. ( ), ACT. ( ) MH [21] SCHEDULE EST ( ), ACT ( ) DAYS

[22] ACTIVITY NO	[23] TASK DESCRIPTION	[24] DATE INITIATED

[25] REMARKS:

[27] DISTRIBUTION:
[28] CONST PROJECT MANAGER
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

[26] ALL EN DES ACTION COMPLETE:

C. H. Bowerbay [illegible] 4-26-84
*BRANCH CHIEF/ORG. DATE

WEB 840427 013
MEDS ACCESSION NO.

EN DES
NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

NCR NO. WBNSWP8312

SIGNIFICANT
YES ☐ NO ☒

REPORTABLE
YES ☐ NO ☒

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 ☐ No ☐ If yes, list in (C) below.

C. Documents related to the NCR (ECN, analyses, memos, contract No., etc.)

	REF OR MEDS ACCESS. NO.	COMPLETION DATE
SUPPORT CALCULATION (47A060-3-9)	WBP840305040	3/5/84
SUPPORT CALCULATION (47A060-3-11)	WBP840305041	3/5/84

D. Is action by organization outside EN DES required? Yes ☐ No ☒
Organization tracking No. _____

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 ☒ No ☐

G. Remarks:

Verified By _____ Date 3/5/84

TVA 10700A (EN DES--12/83)

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

MEDS Accession No. EEB 8401180929

[1] REPORT NO. WBNEEB8401

[2] PLANT	Watts Bar Nuclear Plant	[3] UNIT	1 and 2
[4] PREPARER/ORGANIZATION/DATE	D. D. Dayton/EEB/1-10-84		

[5] DESCRIPTION OF CONDITION

Documentation is not available to show that the Class 1E medium voltage power cables will not exceed its rated maximum continuous copper temperature of 90°C when installed in cable trays.

8402240844 (2)

[6] DATE OF OCCURRENCE EST (X), ACT. ( )	1-9-84	[9] SIGNIFICANT CONDITION ADVERSE TO QUALITY	YES [X] NO [ ]
[7] METHOD OF DISCOVERY	Black & Veatch Finding G901		
[8] UNID CODE (EN DES-EP 8.01)	N/A	[10] *BRANCH CHIEF/DATE	1/11/84

[11] CORRECTIVE ACTION:

[12] CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES [ ] NO [ ]

[13] DESIGN CRITERIA DOCUMENT NO. EXCEPTION REQUEST NO.

[14] ECN REQUIRED [ ] YES NO [ ] ECN NO [15] SCHEDULE IMPACT [ ] P [ ] A [ ] N

NONCONFORMANCE REPORT

[1] REPORT NO. WBNEEB8401

[16] ASSIGNABLE CAUSE (REQUIRED IF SIGNIFICANT)

[17] THIS IS A GENERIC CONDITION YES ☐ NO ☐

[18] ACTION REQUIRED TO PREVENT RECURRENCE (REQUIRED IF SIGNIFICANT)

[19] *INDEPENDENT REVIEW. JZ Wagner 2/3/84

[20] LABOR EST. ( ), ACT. ( ) MH [21] SCHEDULE EST ( ), ACT ( ) DAYS

[22] ACTIVITY NO. [23] TASK DESCRIPTION [24] DATE INITIATED

[25] REMARKS:

This NCR is superseded by NCR WBNEEB8401R1, MEDS accession number EEB 840202 906.

[27] DISTRIBUTION:
CONST PROJECT MANAGER
[28] EN DES PROJECT MANAGER
CHIEF, ESB
OFFICE OF QA
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MED/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

cc: D. D. Dayton, W8C177 C-K

[26] ALL EN DES ACTION COMPLETE

*BRANCH CHIEF/ORG. DATE 2/6/84

EEB '840207 912

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 84 (03-9-83)

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 Findings, W10A17 CK

DATE : March 20, 1984

8403300503 (1)

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 L. Jones

HLJ:WBW
Attachment

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

1720

WATTS BAR NUCLEAR PLANT

UNITS 1 AND 2

TASK FORCE REPORT

EVALUATION OF BLACK AND VEATCH FINDINGS

March 19, 1984

Prepared by:

H. G. Jones, Chairman

E. H. Cole

D. R. Denton

J. A. McDonald

R. C. McKay

BLACK AND VEATCH

TASK FORCE REPORT

EVALUATION OF BLACK AND VEATCH FINDINGS

TASK FORCE REPORT

EVALUATION OF BLACK AND VEATCH FINDINGS

I. EXECUTIVE SUMMARY

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 (B&V) 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:

- 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,
- 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,
- 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 commited 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 Coordinate 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:

- bring past work generically up to a baseline of acceptability, and
- 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:

1) Task force reviews, categorizes, and preliminarily assesses the findings to streamline the evaluation process and identifies the responsible line organization to handle each category.
2) Task force initiates final evaluation of each category by the responsible organization.
3) 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.

5) 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 basis 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.

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. (Categories 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,

- 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

Near 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 licensability 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:

- 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

- 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:

- 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:

- 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,

- 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,

- These deviations would not have prevented the performance of any nuclear safety function which is a part of the licensing bases.

VII. REFERENCES

1. E. Gray Beasley's memorandum to the OEDC MO Files dated March 1, 1983 (EDC 830301 401).

2. E. Gray Beasley's memorandum to the OEDC MD Files dated March 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 1
TASK FORCE CATEGORIZATION OF BLACK & VEATCH
FINDINGS

		Type	Type	Sequence
F100	Failure to monitor operability of MD AFW pump lube oil pump - will monitor, BCH	B	O PL	20
F101	Errors on control diagram - 4719600 Series correct, BCR	B	B PL	3
F102	Errors on control diagram - vendor drawing correct, BCR	B	B PL	3
F103	Errors on logic diagram - instrument tab/schematic drawings correct, BCR	B	B PL	3
F104	Must interchange two S/G Lis - drawing error, BCR	B	O PL	3
F105	Error on schematic (switch configuration) - fabrication drawings correct, BCR	B	B PL	3
F106	Error on logic diagram (blockout/SI pump start) - schematic drawing correct, BCR	B	O PL	3
F107	Errors on 4719600 Series drawings - vendor drawings correct, BCR	B	B PL	3
F108	Red indicating light for valve thermal overload bypass does not verify operation of relays K1 through K6 - designed scheme reviewed by NRC and approved in SER	C	B	38
F109	Designation of relay coils on drawings - no discrepancy	B	B	1 (1)
F110	Errors on connection drawing - schematic drawing correct, BCR	B	B PL	3
F111	Errors on connection drawing - schematic drawing correct, BCR	B	O PL	3
F112	Under certain conditions and failure of Westinghouse W-2 control switch, indicating lights will light dimly - still detect malfunction, will test to confirm acceptability	C	B	37
F113	Time delay relay setting on schematic drawing do not agree with logic drawing - failure to have written program, BCR	B	B PL	20
F114	Errors on schematic drawing - instrument tab correct, BCR	B	B PL	3
F115	Designation of malfunctioning relay coil - drawing revision required, BCR	B	B PL	3
F116	Errors on connection drawing - schematic drawing correct, BCR	B	B PL	3
F117	Error on external connection drawing - schematic diagram correct, BCR	B	B PL	3
F118	Failure to monitor for failure of Westinghouse W-2 switches, IE Bulletin 80-20 - following identification of need for trained circuit, will modify to meet requirements of Bulletin 80-20	C	B	4
F119	FSAR errors concerning conformance to RG 1.106 - FSAR revisions required	O	B PL	31

		Level 2 Type	Level 3 Type	Category
F120	Valve nomenclature drawing errors, "HPSI" should be "ECCS" - previously identified by NRC FR	C	R PL	1 (1)
F121	Thermal overload bypasses use safety injection signal, not accident signal (RG 1.106) - need NRC concurrence	C	O	4
F122	Testing scheme does not verify operation of all relays used to bypass valve thermal overload - design reviewed and approved by NRC, meets RG 1.106 and IEEE STD 279-1971	C	R	30
F123	Lack of drawing reference on drawing - reference to facilitate search	R	R PL	3
F124	Wrong reference drawing on drawing - reference to facilitate search	R	R PL	3
F125	Time delay relay setting on schematic drawing do not agree with logic drawing - failure to have written program, NCR	R	R PL	20
F126	Failure to specify time delay relay setting - failure to have written program, NCR	O	R PL	20
F127	Errors on schematic drawing - connection/vendor drawings correct, NCR	R	R PL	3
F128	Do not bypass "open" torque switch on "trip and throttle valve" per IE Circular 81-13 - will modify, NCR	R	O PL	23
F129	Schematic diagram does not agree with logic diagram for "trip and throttle valve" - revise schematic	R	O	3
F130	Errors on logic diagrams - instrument tab/schematic drawings correct, NCR	R	R PL	3
F131	Errors on electrical schematic - instrument tab correct, NCR	R	R PL	3
F132	Time delay relay setting on schematic drawing do not agree with logic diagram - failure to have written program, NCR	R	R PL	20
F133	Failure to have indication when valve FCV-1-51 thermal overloads are bypassed, failure to verify by testing - NCR	R	O PL	23
F134	Lack of test data for flame test of cable - cable passed flame test	R	R	1 (1)
F135	Questions concerning cable tray fill criteria by computer - GEDC attempted to justify criteria	C	O	36
F136	Questions concerning electrical circuit protective devices - finding identifies inappropriate device, situation is acceptable, ECN	C	R	1 (1)/3
F137	Trip setting for electrical breaker not in accordance with manufacturer's recommendation - settings are in accordance with manufacturer's recommendations	C	C	35
F138	Lack of indication for channel bypass/inoperable status - not applicable for AFW system	R	R	1 (1)
F139	Two ECN cover sheets utilizing same number	R	R PL	1 (1)
F140	Insufficient documentation to justify environmental qualification of AFW pump motor drives - previously identified, NCR	C	C	19

		Level 2 Type	Level 3 Type	Category
F141	Questions concerning cable raceway markings and termination error - error on external connection drawing, ECN	C	R PL	3
F142	Use of wrong cable type for MD AFW pump - termination information was in error, correct cable used, ECN	C	R PL	13
F143	Termination tickets do not agree with connection diagram - termination tickets do agree with connection diagram	R	R	1 (1)
F144	Some instrumentation and controls not environmentally qualified for HELB-NUREG 0588 program will assure qualification	C	O	19
F300	Incompatibility between sec. chem feed and AFW process piping - previously identified by GEDC, ECN	O	O	1 (2)
F301	Minimum wall thickness of system piping - calc given to B&V	R	R	1 (1)
F302	TPIPE not described in FSAR - but in letter to NRC	O	R	1 (1)
F303	Discrepancies between two parts of FSAR - not discrepancy between licensing application and the design and construction	C	O PL	4
F304	Valve acceleration form/stress qual. table not in problem file - are in file package	R	R	4
F305	See F304	R	R	4
F306	See F304	R	R	4
F307	Errors on flow diagram concerning design conditions - material adequate for design conditions, ECN	R	R	5
F308	Errors on Bill of Materials concerning design conditions - material adequate for design conditions	R	R	5
F309	FSAR ≠ logic diagram - FSAR revision required	R	R	4
F310	Isometric ≠ another isometric/TPIPE analysis - drawing revision required, ECN	R	O PL	6
F311	Isometric ≠ TPIPE analysis - support designed correctly, drawing revision required, ECN	R	R	1 (1)
F312	Questions relating to system pressure drop calculations - revised calc to show diff. 40°F-40°F	C	R	1 (1)
F313	See F304	R	R	4
F314	Errors on Bill of Materials concerning design conditions - installed material adequate for design conditions	R	R	5
F315	Interpretation of ASME Section III for pump casing - GEDC attempted to justify position	C	R	1 (1)
F316	Calc for line sizes - calc given to B&V	R	R	1 (1)
F317	No calculations to support design conditions on flow diagram - piping calculations provided to B&V, piping design is adequate	R	R	1 (1)

		Level 2 Type	Level 3 Type	Category
F318	Valves with g loading greater than specified in SM - TVA analysis justified valves	C	R	1 (1)
F319	TPIPE analysis does not agree with anchor load table - anchor program analysis output not conservative when compared to issued load requirements, designed anchor does not meet stiffness requirements, NCR	C	C	6
F320	Lack of temp stress analysis when using fire protection connection - existing analysis covers	R	R	1 (1)
F321	Error in FSAR concerning reference to interface discussion - FSAR revision, not discrepancy between licensing application and design and construction	R	R PL	31
F322	Lack of flange qualification in stress analysis - analysis done after the fact, NCR	C	R	25
F323	See F318	C	R	1 (1)
F324	TPIPE analysis does not agree with anchor load table - anchor program analysis output not conservative when compared to issued load requirements, designed anchor does not meet stiffness requirements, NCR	C	C	6
F325	TPIPE analysis does not agree with anchor load table - anchor program analysis output not conservative when compared to issued load requirements, NCR	C	R	6
F326	Interpretation of ASME Section III for pump casing - OEDC attempted to justify position using "Allowance for Variation from Design Condition" in code	C	R	1 (1)
F327	TPIPE analysis does not agree with individual load cases in FSAR - calculations given to NAV, acceptable	C	R	1 (1)
F328	Design temp/pressure of some valves greater than procurement spec - Valves adequate for maximum system temp/pressure, NCR	R	R PL	5
F329	Isometric information inconsistent - finding is in error	R	R	1 (1)
F330	Capping secondary chemical feed line, not adding block valve as discussed with NRC - acceptable solution, NCR	R	R	1 (2)
F331	Temp on stress isometric & flow diagram - used realistic and conservative temperature	R	R	11
F332	Exceed I-R pump nozzle loads - loads are exceeded, stress (due to faulted nozzle loads) is below normal allowables, analysis confirms acceptability	C	R	1 (2)
F333	Runout of MD pumps may exceed motor rating - OEDC position is that this is acceptable for events postulated in in the finding	C	R PL	1 (1)
F334	Verify the technical adequacy of TVA calculations which hydraulic/safety analysis is based - bounding approach acceptable	C	R	1 (1)
F335	Valves have accelerations which exceed 2 g vertical, 3 g horizontal allowables - OEDC attempted to justify	C	C	5
F336	Valves have stresses which exceed .76 Sy allowable stress - OEDC attempted to justify	C	C PL	5
F337	Lack of active valve stress qual. table in file per FSAR - information is retrievable	R	R	1 (1)

		Level 2 Type	Level 3 Type	Category
F338	Lack of valve acceleration summary form in file per FSAR - information is retrievable	R	R	1 (1)
F339	TPIPE (4" pipe) ≠ flow diagram/isometric (1-1/2" pipe) - TPIPE used correct 4" pipe	C	R	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 hanger, justification provided to B&V	C	R PL	1 (2)
F341	Movement (0.0") 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 B&V	C	R PL	1 (2)
F342	Anchor load table ≠ TPIPE printout - anchor load table was being revised	C	R	1 (2)
F343	See F342	C	R	1 (2)
F344	See F342	C	R	1 (2)
F345	See F342	C	R	1 (2)
F346	Support design load value ≠ TPIPE analysis - NCR	C	O	6
F347	No evidence of calculations for support spacing for some pump recirculting piping - NCR	O	O	12
F348	Questions concerning heat load for HVAC - calculations given to B&V	R	R	1 (1)
F349	No evidence that pumps designed for faulted load conditions - were evaluated and meet normal allowables	O	R	1 (1)
F350	Valve, fitting, piping, and pump materials do not conform to those specified in FSAR, Table 6.1-1 - table is typical	R	R	1 (1)
F351	No technical justification for PCV setpoint of 1215 lb/in^{2}d (550 gal/min) - used engineering judgment	O	R PL	1 (1)
F352	Value for AFW flow following accidents/transients and single failure not consistent - CEDC reviewed worst case	O	R PL	1 (1)
F353	Piping volume data not provided to B&V - calculations were provided	R PL	R	1 (1)
F354	Questions about flow rates during steam line break accident - worst case flows used in calculations and used by Westinghouse	O	R	1 (1)
F355	Questions relating to system pressure drop calculations - resolution subject to F312	R	R	1 (1)
F356	Isometric drawing ≠ TPIPE analysis (support not in analysis) - dead weight hanger, not needed in analysis	R	R	1 (1)
F357	Restraint modeled for rigid restraint in vertical direction, support restrains axial/lateral - redesign in process	O	O PL	1 (2)
F358	TPIPE computer design load ≠ hanger drawing load - hanger redesign in progress	O	O	1 (2)
F359	Restraint is solid strut assembly, TPIPE indicates dynamic snubber - restraint redesign in process	O	O PL	1 (2)

		Level 2 Type		Level 3 Type	Category
F360	Restraint is rigid strut assembly, TPIPE indicates dynamic snubber - restraint redesign in process	O		O PL	1 (2)
F361	Restraint is rigid strut assembly, TPIPE indicates dynamic snubber - restraint redesign in process	O		O PL	1 (2)
F362	Restraint is rigid strut assembly, TPIPE indicates dynamic snubber - restraint redesign in process	O		O PL	1 (2)
F363	Hanger not installed - incomplete work	R	PL	O PL	1 (2)
F364	Support does not allow .4-inch movement as analyzed in TPIPE and FSAR - NCR	O		O PL	1 (2)
F365	TPIPE analysis indicates rigid restraint in Y direction, freedom in X and Z direction not provided by hanger design - NCR	C		C	1 (2)
F366	Hanger constructed per FCR H7213, FCR H7213 rejected by SWP - constructed per FCR H8296 after rejection of FCR H7213	O		O	1 (2)
F367	TPIPE analysis indicates axial movement of .4", hanger construction does not allow - not installed per design drawing, NCR	C		C	7
F368	TPIPE computer design load ≠ hanger drawing load - drawing had been revised with correct load	R		R	1 (1)
F369	No restraint drawing for required restraint as indicated by TPIPE analysis - failed to revise per analysis, NCR	C		C	14
F370	Restraint designed for loads of +5000 lbs/-4000 lbs, TPIPE indicates loads of +6300 lbs/-5700 lbs - redesign in process	O		O	1 (2)
F371	TPIPE analysis indicates load of +760 lbs/-680 lbs, hanger design is +60 lbs/-30 lbs - failed to revise per analysis, NCR	C		C	14
F372	TPIPE indicates loads of +490 lbs/-800 lbs, restraint drawing loads of +360 lbs/-360 lbs - restraint adequate per Bill of Materials	R		O PL	1 (2)
F373	No documentation to support operating temperature used in pipe stress analysis - NCR	C		O PL	11
F374	Structural adequacy of hanger following reduction of tube size from 4"x4" to2"x2" - adequacy will be documented by FCR H7634	O	PL	O PL	1 (2)
F500	Questions concerning g loading for seismic response - acceptable	R		R	1 (1)
F501	MD AFW pump lube oil console, did not consider SSE - acceptable	R		R	1 (1)
F502	Containment analysis used 23 mass points, FSAR states 13 used - revise FSAR	O		R PL	4
F503	Traceability of input/output for floor response spectra - CEDC feels method is acceptable	C		O	1 (4)
F504	5% eccentricity for containment not considered as stated in FSAR - NCR	C		C	4

		Level 2 Type		Level 3 Type		Category
F505	Lack of independent checking of computer output - acceptable method utilized	R		R		1 (1)
F506	Finding to document NCR NRNCEB8203 (excessive loads/eccentric load on embedments) closure - entered into documented tracking program	O	PL	O	PL	9
F507	Insufficient calculations in EDS report for seismic analysis of Auxiliary-Control Building-detailed calculations given to B&V	O		R		1 (1)
F508	Base plates designed using rigid analysis, should use flexible analysis - attempted to justify, being handled by evaluation per OIE Bulletin 79-02	C		O		1 (2)
F509	Model of internal concrete structure does not properly consider location of the shear center - model in FSAR, NRC issued SER after reviewing model, ORDC adequately predicted the responses	C		R		1 (1)
F510	Lack of basis for the frequencies/mode shapes used to generate spectra - acceptable method	R		R		1 (1)
F511	TPIPE analysis not properly "broadened" as required by FSAR - acceptable method used, detailed calculations given to B&V, NCR	O		O		4
F512	Horizontal response spectrum for 6.9 kV switchgear does not envelop the E-W response spectrum for El.755.5 - provided justification and detailed calculations to B&V	O		R		1 (2)
F513	Use of multiple response spectra not per FSAR - identified as NRC inspection item, NCR	C		O		4
F700	Hanger not installed - incomplete work	R	PL	O	PL	1 (2)
F701	Hanger not installed - incomplete work	R	PL	O	PL	1 (2)
F702	Hanger not installed - incomplete work	R	PL	O	PL	1 (2)
F703	Hanger not welded on inside - provided design calculations to verify acceptability	R		R		1 (1)
F704	Hanger has overheated beam with weld, 4'-10" dia. is 2'-11", added 4" tube steel - NCR	C		O		7
F705	Excessive angle on hanger brace - acceptable deviation	R		R		1 (1)
F706	Hanger cannot be reviewed because concealed inside a wall sleeve - CONST has inspected and documented configuration	R		R		1 (1)
F707	Hanger welded to embedded plate, did not use concrete fasteners, revised elevation 3-1/2" higher - acceptable deviations	R		R		1 (1)
F708	Excessive angle on hanger brace - acceptable deviation	R		R		1 (1)
F709	Hanger not welded on inside - acceptable deviation	R		R		1 (1)
F710	Excessive loads/eccentric load on embedments - NCR, this embedment acceptable	C	PL	R		9

		Level 2 Type	Level 3 Type	Category
F711	Excessive loads/eccentric load on embedments - NCR, this embedment acceptable	C PL	R	9
F712	Excessive loads/eccentric load on embedments - NCR, this embedment acceptable	C PL	R	9
F713	Excessive eccentric load on embedment - PCR MB003, this embedment acceptable	R	R	9
F714	Missing grout under standard instrumentation supports - incomplete work	C PL	O PL	1 (2)
F715	Hanger not welded on inside at bottom, two wall plates used not one as on drawing - incomplete work	R	R	1 (2)
F716	Hanger not welded on inside - acceptable deviation	R	R	1 (1)
F717	Hanger not welded on inside - acceptable deviation	R	R	1 (1)
F718	Hanger not welded on inside, not welded on one side at embedment - acceptable deviation, NCR	C	O PL	7
F719	Grout under hanger base plates is cracked and chipped - NCR	C	O PL	7
F720 R1	Casing vent line to drain from MD pump neither anchored nor grouted - temporary	R	O PL	1 (2)
F721	No grout under hanger base plate - incomplete work	R PL	O PL	1 (2)
F722	Hanger anchor bolts missing - installed and finalized correctly, documentation provided to S&V	R	R	1 (1)
F723 R1	Rods sticking up from floor are rusted - will be cleaned prior to grouting	R	R	1 (2)
F724 R1	Need to design embedment for eccentric loads - NCR, this embedment acceptable	R	R	9
F725 R1	Need calculations to verify acceptability of plate welded to embedment - calc prove acceptability	R	R	1 (1)
F726	Hanger has support with 6°32' attachment - NCR	C	O	7
F727	Hanger free to slide - Rev. 0 documented by CONST, Rev. 901 had been issued by EN DES, incomplete work	O PL	O PL	1 (2)
F728 R1	Hanger not installed per drawing - acceptable deviation	R	R	1 (1)
F729 R1	Hanger not installed per drawing - acceptable deviation	R	R	1 (1)
F730 R1	Need to design embedment for eccentric loads - NCR, this embedment acceptable	R	R	9
F731 R1	Hangers installed 1"-2" apart on embedment, maybe overstressed - NCR, this embedment acceptable	C	R	9
F732	Hanger free to slide - acceptable, pipe restrained in vertical direction per analysis	O PL	O PL	1 (2)
F733	Hanger not installed per drawing - incomplete construction	R PL	O PL	1 (2)
F734	Hanger cotter pins missing - NCR	R PL	O PL	7

		Level 2 Type	Level 3 Type	Category
F735	Hanger not welded on inside - acceptable deviation	R	R	1 (1)
F736	Hanger has support with 8°21' attachment - NCR	C	O PL	7
F737	Hanger rod has not been installed on hanger - NCR	C	O PL	7
F738	Tag on hanger cannot be read - acceptable	R PL	R	1 (1)
F739	No tag on hanger - acceptable	R PL	R	1 (1)
F740	Excessive angle on hanger rod - acceptable deviation	R	R	1 (1)
F741	Hanger has rod with 6°18', 8' 1-1/2" dimension should be 8'6", 1'11" should be 6" - acceptable deviations	R	O	1 (1)
F742	Hanger needs to be revised per PCR H8382 - NCR	C	O	1 (2)
F743	Hanger tag has wrong designation - acceptable	R PL	R	1 (1)
F744	Hanger not welded on inside - acceptable deviation	R	R	1 (1)
F745	Added plate to hanger - acceptable deviation	R	R	1 (1)
F746	Hanger not installed per drawing - redesigned by PCR H 8268	R	R PL	1 (1)
F747	Hanger 10'0" dimension is 6'6", added brace plates - 10'0" dimension field verified, acceptable, ECN	R PL	O	1 (1)
F748	Hanger support not installed - redesign/rework required, incomplete work	R PL	O PL	1 (2)
F749	Hanger rod has not been installed - NCR	C	O PL	7
F750	Hanger not welded on inside - acceptable deviation	R	R	1 (1)
F751	Hanger not welded on inside - acceptable deviation, drawing looking east, not south, ECN	R	R PL	6
F752	Hanger not welded on inside - acceptable deviation	R	R	1 (1)
F753	Hanger tag and hanger drawing number should be revised - acceptable, ECN	R	R PL	12
F754	Welded hanger directly to embedment plate - acceptable deviation	R	R	1 (1)
F755	Plate added to hanger, revised dimension - acceptable deviations	R	R	1 (1)
F756	Hanger 6'7-3/4" dimension is 7'3-3/8" - failed to revise per analysis, NCR	C	C	14
F757	Hanger has more steel bracing that shows on drawing - incomplete work, modified by PCRs H8237, H8296, H8893	O	O	1 (2)
F758	Concrete behind cinch anchor chipped - installation not complete	R PL	O PL	1 (2)

		Level 2 Type		Level 3 Type		Category
F759	Piping drawing should be revised to reflect condensate line location - revised by FCR M8091	R	PL	O		1 (1)
F760	Bolts loose on clamb anchor for hanger - installation not complete	R	PL	O	PL	1 (2)
F761	Hanger attached to three separate embedment plates, question adequate welds - calculations prove the hanger acceptable, NCR	R		R		18
F762	AFW MD pump drain line not anchored to structure - temporary	R		O	PL	1 (2)
F763	Hanger not installed per drawing - revised per FCR M-7506	R		C		1 (4)
F764	Brace runs from hanger down to wall, not up - incomplete work	R	PL	O	PL	1 (2)
F765	Hanger welded to embedment plate rather than bolt on plate - acceptable deviation	R		R		1 (1)
F766	Hanger revised by FCR M8404, changed material, support not installed - FCR M8404 incorporated changes	R		R		1 (2)
F767	Hanger welded to embedment plate, 9'0" dimension should be 10'5" - acceptable deviation, failed to review per analysis, NCR	C		C		16
F768	Hanger welded to embedment plate, did not use concrete fasteners - modified by FCR M8083	R		R		1 (1)
F769	Grout missing from hanger base plate - incomplete construction	R	PL	O	PL	1 (2)
F770	Grout missing from hanger base plate - incomplete construction	R	PL	O	PL	1 (2)
F771	Hanger is welded to embedment plate on one end, weld length 21-1/2" - revised & acceptable per FCR M7618	R		R		1 (1)
F772	Hanger riser clamp angle was specified as 30°, is installed 22° 45' - NCR	O	PL	O	PL	7
F773	Hanger rod angle is 4° 30', cotter pins are missing - angle acceptable deviation, NCR	O	PL	O	PL	7
F774	Hanger cotter pin missing - NCR	R	PL	O	PL	7
F775	Hanger loose on pipe, welded to embedment plate - NCR, acceptable deviation	C		C		1 (2)
F776	Hanger end attachment at wall is rotated 90°, cotter pins missing - NCR	C		O		7
F777	Hanger not completely installed - incomplete work	R	PL	O	PL	1 (2)
F778	Hanger has not been installed - incomplete work	O	PL	O	PL	1 (2)
F779	Hanger has not been installed - incomplete work	O	PL	O	PL	1 (2)
F780	Hanger has not been installed - incomplete work	O	PL	O	PL	1 (2)
F781	Hanger installed per drawing, drawing marked "VOID," hanger not on piping isometric - hanger removal per tracking program	O	PL	O	PL	1 (2)

		Level 2 Type	Level 3 Type	Category
F782	Hanger brace has not been installed - hanger revised by FCR H-7598, redesign	R	R PL	1 (2)
F783	Hanger welded to embedment plate, 1'8" dimension should be 0'8" - acceptable deviation, failed to revise per analysis, NCR	C	C	14
F784	Hanger welded to embedment plate, 2'6" dimension is 11-3/8" - acceptable deviation, failed to revise per analysis, NCR	C	C	14
F785	Hanger lugs not installed on pipe, not welded on inside - incomplete construction, acceptable	O PL	O PL	1 (2)
F786	Hanger installed except cotter pin missing, drawing marked "void" - being considered temporary	O PL	O PL	1 (2)
F787	Two lugs not installed - redesign/rework required	O PL	O PL	1 (2)
F788	Hanger has not been installed - failed to revise per analysis, NCR	O PL	C	14
F789	Hanger has not been installed - incomplete work	O PL	O PL	1 (2)
F790	Hanger not completely installed - redesign/rework required	O PL	O PL	1 (2)
F791	Hanger has not been installed - being redesigned, construction required	O PL	O PL	1 (2)
F792	Hanger has not been installed - incomplete work	O PL	O PL	1 (2)
F793	Hanger has loose concrete behind base plate - reinspected and would have been acceptable	R	O PL	1 (1)
F794	Hanger 8'2-3/8" dimension is 7'4-3/8", 3'9" dimension is 4'10", not welded on inside - failed to revise per analysis, NCR, acceptable deviation	C	C	14
F795	Hanger not welded on inside - acceptable deviation	R	R	1 (1)
F796	Excessive angle on hanger brace - acceptable deviation	R	R	1 (1)
F797	Added plate to hanger - acceptable deviation	R	R	1 (1)
F798	Revised hanger anchor plate - acceptable deviation	R	R	1 (1)
F799	Revised hanger/relocated hanger, redesigned per FCR H-7597, relocation - acceptable deviation	R	R	1 (1)
F800	Error on valve nomenclature, "HPFP" should be "ERCW" - EDR, previously identified	C	R PL	1 (2)
F801	Time delay relay setting not on schematic drawing - failure to have written program, NCR	C	O	20
F802	Field wiring not in accordance with wiring diagram - connection drawing wrong, NCR	C	R PL	3
F803	Field wiring does not agree with schematic diagram - TVA internal connection diagram to be revised to reflect deleted relay	C	O	3

		Level 2 Type		Level 3 Type		Category
F804	Field wiring not in accordance with wiring diagram - connection drawing wrong, schematic diagram correct, ECN	C		R PL		3
F805	Field wiring not in accordance with schematic diagram - schematic diagram wrong, connection diagram correct, ECN	C		R PL		3
F806	Wire tag does not agree with field wiring - TVA external connection drawing wrong, incomplete construction, ECN	C		R PL		3
F807	Cables not tagged with division color code - tags were already installed at top of panel, would be identified during walkdown	C		R PL		33
F808	AFW TD pump not completely installed - incomplete work	R	PL	O PL		1 (2)
F809	Specific example of circuit identification not legible per FSAR - will be identified during transfer walkdown, no effect on safety	C		R PL		33
F810	FM-3-142 not installed, tags not installed on panel 1-L-381 - incomplete work	R	PL	O PL		1 (2)
F811	Transfer switch has missing tag, level monitors not installed - incomplete construction	R		O PL		1 (2)
F812	Improper tags on switches, level monitors not installed - incomplete construction	R		O PL		1 (2)
F813	On local panels, instrument bloudowns not connected to common bloudown header - common practice for panels with nonradioactive fluid	R		R		1 (1)
F814	Panel located in congested area - accessibility is not a problem, acceptable	R		R		1 (1)
F815	Temporary hanger still installed - incomplete work	R	PL	O PL		1 (2)
F816	Hanger has loose clamp on pipe, rod not installed, no tag - temporary hanger	R	PL	O PL		1 (2)
F817	Hanger has loose clamp on pipe, rod not installed, no tag - temporary hanger	R	PL	O PL		1 (2)
F818	Hanger has loose clamp on pipe, rod not installed, no tag - temporary hanger	R	PL	O PL		1 (2)
F819	Hanger hits tray support - NCR	O	PL	O		7
F820	Temporary hanger still installed - incomplete work	R	PL	O PL		1 (2)
F821	Hanger supports welded to a protective device, welded to embedment plate - hanger drawing will be "voided" per redesign, constructed hanger must be removed, ECN	O	PL	O PL		14
F822	Hanger sealed in wall sleeve, cannot inspect - CONST has inspected and documented configuration	R		R		1 (1)
F823	Hanger welded to embedded plate rather than bolted to the wall-acceptable deviation	R		R		1 (1)
F824	Hanger not completely installed - incomplete work	O	PL	O PL		1 (2)
F825	Hanger not completely installed - incomplete work	R	PL	O PL		1 (2)

		Level 2 Type	Level 3 Type	Category
F826	Hanger not installed - incomplete work	O PL	O PL	1 (2)
F827	Hanger not installed - incomplete work	O PL	O PL	1 (2)
F828	Bolt not tightened, grout not installed - incomplete work	O PL	O PL	1 (2)
F829	Hanger not installed - incomplete work	R PL	O PL	1 (2)
F830	Hanger not installed - incomplete work	O PL	O PL	1 (2)
F831	Hanger not installed - incomplete work	R PL	O PL	1 (2)
F832	Hanger not installed - incomplete work	O PL	O PL	1 (2)
F833	End attachment not installed in forward bracket, one cotter pin missing - incomplete work	R PL	O PL	1 (2)
F834	Hanger not installed - incomplete work	O PL	O PL	1 (2)
F835	Hanger not installed - incomplete work	O PL	O PL	1 (2)
F836	Hanger not installed - incomplete work	O PL	O PL	1 (2)
F837	Hanger not installed - incomplete work	O PL	O PL	1 (2)
F838	Hanger not installed - incomplete work	O PL	O PL	1 (2)
F839	Hanger not installed - incomplete work	O PL	O PL	1 (2)
F840	Hanger not installed - incomplete work	O PL	O PL	1 (2)
F841	Hanger not installed - incomplete work	O PL	O PL	1 (2)
F842	Hanger sealed in protective device, cannot inspect - construction documentation provided to B&V	R	R	1 (1)
F843	Hanger not installed per drawing - redesign in process	O PL	O PL	1 (2)
F844	Hanger in protective device, cannot confirm installation, elevation looking east, not south - hanger inspected and documented, ECN	R	R	1 (1)
F845	Hanger sealed in protective device, cannot confirm installation, elevation looking north, should be west - failed to revise per analysis, NCR	C	C	14
F846	Hanger sealed in protective device, cannot inspect - construction documentation provided to B&V	R	R	1 (1)
F847	Hanger not completely installed - incomplete work	R PL	O PL	1 (2)
F848	Hanger not installed per drawing or identified FCR - acceptable deviation	R PL	R PL	1 (1)

		Level 2 Area	Level 3 Area	Disposition
7849	Hanger note on 1" of grout - acceptable deviation	□	□	1 (11)
7850	Hanger support revised - revised per PCN 17317	○ R	○ R	1 (11)
7851	No tag on hanger - acceptable	□	□	1 (11)
7852	Hanger welded to embedded plate rather than base plate - acceptable deviation	□	□	1 (11)
7853	Hanger not installed per drawing - failed to revise per analysis, PCN	◎ R	◎	M
7854	Hanger not installed - incomplete work	□ R	○ R	1 (12)
7855	Hanger located 0-1/2" further south than drawing indicates - failed to revise per analysis, PCN	◎	◎	M
7856	Temporary hanger still installed - incomplete work	□ R	○ R	1 (12)
7857	Sleeve shown on piping isometric not required - sleeve shown on "cut of Austin" drawing, BCH	□ R	□ R	M
7858	Hanger number wrong on piping isometric - wrong on drawing, BCH	□ R	□ R	M
7859	Piping isometric 2'9" dimension is 3'0", 10'0" dimension is 9'6" - field verified correct per piping isometric	□	○	1 (11)
7860	Temporary hanger still installed - incomplete work	□ R	○ R	1 (12)
7861	No tag on hanger - procedure for inspection ([illegible]-QP-4.22-0) attached, dated 7/16/82, not nonconforming	□ R	□	1 (11)
7862	Temporary hanger still installed - incomplete work	□ R	○ R	1 (12)
7863	Piping resting on hanger for ductwork - incomplete work	□ R	○ R	1 (12)
7864	3 bolts missing from flange - incomplete work	□ R	○ R	1 (12)
7865	Hanger number wrong on piping isometric - wrong on drawing, BCH	□ R	□ R	M
7866	Hanger number wrong on piping isometric - wrong on drawing, BCH	○ R	□ R	M
7867	Piping has not been insulated - incomplete work	◎ R	◎ R	1 (12)
7868	Hanger not installed - hanger drawing released from voided status, BCH	◎	◎	G
7869	Piping has not been insulated - incomplete work	□ R	◎ R	1 (12)
7870	Hanger not installed - incomplete work	□ R	○ R	1 (12)
7871	Hanger not installed - incomplete work	□ R	◎ R	1 (12)
7872	No tag on hanger - acceptable	□	□	1 (11)

		Level 2 Type		Level 3 Type		Reference
F873	Hanger not installed - incomplete work	R	PL	O	PL	1 (2)
F874	Hanger not installed - incomplete work	R	PL	O	PL	1 (2)
F875	Hanger not installed - incomplete construction, hanger now installed per FCR M8878	R		O	PL	1 (2)
F876	Hanger not installed - incomplete work	R	PL	O	PL	1 (2)
F877	Hanger drawing dimension 5'11" in "location plan" should be 6'6-1/2" - redesigned, reinspection by Construction required	O	PL	O	PL	1 (2)
F878	Hanger not installed per drawing (welded to embedment plate) - acceptable deviation	R		R		1 (1)
F879	Hanger not installed per drawing (plate added) - acceptable deviation	R		R		1 (1)
F880	Plate added to hanger, no tag on hanger - acceptable deviations	R		R		1 (1)
F881	Hanger not installed per drawing - incomplete work	R	PL	R	PL	1 (2)
F882	Hanger not installed per drawing (plate added) - acceptable deviation	R		R		1 (1)
F883	Hanger drawing should be revised - revised by FCR M6937, incomplete construction	O	PL	O	PL	1 (2)
F884	Hanger drawing should be revised - acceptable deviations, FCR M7812 not properly incorporated, NCR	O	PL	O		7
F885	Hanger not installed per drawing (welded to embedment plate) - acceptable deviation	R		R		1 (1)
F886	Hanger welded to embedment plate - hanger revised by FCR M8236	R		R		1 (1)
F887	Piping has not been insulated - incomplete work	R	PL	O	PL	1 (2)
F888	Temporary hanger still installed - incomplete work	R	PL	O	PL	1 (2)
F889	No tag on hanger - acceptable	R		R		1 (1)
F890	Temporary hanger still installed - incomplete work	R		O	PL	1 (2)
F891	Sleeve shown on piping isometric not required - used to show pipe through platform, no effect on analysis results	R		R		1 (1)
F892	Loose nuts and bolts at flange - incomplete work	R	PL	O	PL	1 (2)
F893	Hanger configuration revised - revised per FCR M8631, incomplete construction	O	PL	O	PL	1 (2)
F894	Should confirm temperature/pressure rating as on drawing - line and valves are adequate for temperature/ pressure conditions, ECN	O		R	PL	5
F895	Data sheet design requirements for valves - valves capable, NCR	R		R		5

		Level 2 Type	Level 3 Type	Category
F896	Data sheet # design requirements for valves - valves capable, NCR	R	R	5
F897	Data sheet # design requirements for valves - valves capable, NCR	R	R	5
F898	Sleeve shown on piping isometric not required - used to show pipe through platform, no effect on analysis	R	R	1 (1)
F899	Hanger not installed, does not show on piping isometric, no hanger drawing - failed to review per analysis, NCR	C	C	14
G900	Seismic spectra generation program used to calculate torsional responses, but not capable - CEBC understands program limitations	R	R	1 (1)
G901	Questions concerning cable derating and cable tray fill - provided procedures for cable routing and justification for adequacy	C	C	20
F902	No bolts in TD AFW pump suction flange - incomplete work	R PL	C PL	1 (2)
F903	Temporary hanger still installed - incomplete work	R PL	C PL	1 (2)
F904	Hanger clamp on piping with no rod, no number - temporary support, incomplete work	R PL	C PL	1 (2)
F905	Hanger not installed - incomplete work	R PL	C PL	1 (2)
F906	Hanger not installed, no hanger drawing - incomplete construction, hanger drawing provided to B&V	C PL	C PL	1 (2)
F907	Hanger not installed, no hanger drawing - incomplete construction, hanger drawing provided to B&V	C PL	C PL	1 (2)
F908	Piping has not been insulated - incomplete work	R PL	C PL	1 (2)
F909	Temporary hanger still installed - incomplete work	R PL	C PL	1 (2)
F910	Sleeve on piping isometric not required - on "out of function" drawing, NCR	R	R PL	14
F911	Hanger not installed, no hanger number on piping isometric, no hanger drawing - failed to review per analysis, NCR	C	C	14
F912	No drawing provided for box anchor - drawing provided for review	R	R	1 (1)
F913	No drawing provided for box anchor - drawing provided for review	R	R	1 (1)
F914	No drawing provided for box anchor - drawing provided for review	R	R	1 (1)
F915	Hanger not installed - incomplete work	R PL	C PL	1 (2)
F916	No drawing provided for box anchor - drawing provided for review	R	R	1 (1)
F917	No drawing provided for box anchor - drawing provided for review	R	R	1 (1)
F918	Hanger not installed - incomplete work	R PL	C PL	1 (2)

		Level 2 Type		Level 3 Type		Reference
F919	Plate added to hanger - NCR	C		C	PL	7
F920	Plate added to hanger - NCR	C		C	PL	7
F921	Plate added to hanger - acceptable deviation	R		R		1 (1)
F922	Hanger support revised - hanger redesigned, incomplete construction	C	PL	C	PL	1 (2)
F923	Hanger support used 2"x2" tube steel, not 4"x4" tube steel per drawing - revised by FCR H7634	C	PL	C	PL	1 (1)
F924	Hanger not welded to embedment plate, one cotter pin missing - incomplete work	R	PL	C	PL	1 (2)
F925	Hanger not installed - incomplete work	R	PL	C	PL	1 (2)
F926	Hanger not installed - incomplete work	R	PL	C	PL	1 (2)
F927	Hanger not called out on piping isometric - ECN incomplete	R		R		1 (2)
F928	Hanger not called out on piping isometric - ECN incomplete	R		R		1 (2)
F929	Hanger not called out on piping isometric - ECN incomplete	R		R		1 (2)
F930	Hanger not called out on piping isometric - ECN incomplete	R		R		1 (2)
F931	Hanger not called out on piping isometric - ECN incomplete	R		R		1 (2)
F932	Piping isometric has wrong hanger number called out - ECN	R	PL	R	PL	32
F933	Hanger not called out on piping isometric - ECN incomplete	R		R		1 (2)
F934	Piping has not been insulated - incomplete work	R	PL	C	PL	1 (2)
F935	Piping has not been insulated - incomplete work	R	PL	C	PL	1 (2)
F936	Piping not inspected because piping is concealed inside protective device - construction documentation provided to B&V	R		R		1 (1)
F937	Hanger not installed, no hanger drawing - hanger installed, documentation provided to B&V	R		C	PL	1 (1)
F938	Temporary hanger still installed - incomplete work	R	PL	C	PL	1 (2)
F939	Hanger number wrong on piping isometric - wrong on drawing, ECN	R	PL	R	PL	32
F940	Temporary pipe still installed - incomplete work	R	PL	C	PL	1 (2)
F941	Hanger not called out on piping isometric - ECN incomplete	R		R		1 (2)
F942	Hanger number wrong on piping isometric - wrong on drawing, ECN	R	PL	R	PL	32

		Level 2 Type		Level 3 Type	Category
F943	Temporary hanger still installed - incomplete work	R	PL	O PL	1 (2)
F944	Hanger has not been called out on piping isometric - ECN incomplete	R		R	1 (2)
F945	Hanger has not been called out on piping isometric - ECN incomplete	R		R	1 (2)
F946	Hanger has not been called out on piping isometric - ECN incomplete	R		R	1 (2)
F947	Hanger not installed, hanger not on piping isometric, no hanger drawing - redesign in process, Construction inspection required	O	PL	O PL	1 (2)
F948	Piping has not been installed - incomplete work	R	PL	O PL	1 (2)
F949	Hanger not installed, hanger not on piping isometric, no hanger drawing - failed to revise per analysis, NCR	C		C	14
F950	Hanger on isometric but not on piping drawing, no hanger drawing, hanger not installed - failed to revise per analysis, NCR	C		C	14
F951	Hanger on isometric but not on piping drawing, no hanger drawing, hanger not installed - failed to revise per analysis, NCR	C		C	14
F952	Temporary hanger still installed - incomplete work	R	PL	O PL	1 (2)
F953	Hanger number not on piping isometric - ECN incomplete	R		R	1 (2)
F954	Temporary hanger welded to embedment plated - incomplete work	R	PL	O PL	1 (2)
F955	Hanger on isometric but not on piping drawing, no hanger drawing, hanger not installed - failed to revise per analysis, NCR	C		C	14
F956	Temporary hanger still installed - incomplete work	R	PL	O PL	1 (2)
F957	Temporary hanger still installed - incomplete work	R	PL	O PL	1 (2)
F958	Hanger not on piping isometric, no hanger drawing, hanger not installed, hanger on isometric - failed to revise per analysis, NCR	C		C	14
F959	Temporary hanger still installed - incomplete work	R	PL	O PL	1 (2)
F960	Temporary hanger still installed - incomplete work	R	PL	O PL	1 (2)
F961	Piping has been revised from piping isometric - being redesigned	C		O	1 (1)
F962	Bolts not installed in flanges - incomplete work	R	PL	O PL	1 (2)
F963	Hanger relocated off more than 6" allowable - failed to revise per analysis, NCR	C		C	14
F964	Hanger relocated off more than 6" allowable - failed to revise per analysis, NCR	C		C	14

		Level 2 Type	Level 3 Type	Category
F965	Hanger relocated off more than 6" allowable - failed to revise per analysis, NCR	C	C	34
F966	Hanger not called out on piping isometric - ECN incomplete	R	R	1 (2)
F967	Hanger construction not accomplished per hanger drawing - being revised by PCR HB721	R	R	1 (2)
F968	Hanger construction not accomplished per hanger drawing - being revised by PCR HB637	R	R PL	1 (2)
F969	Hanger brace changed from 6" square tube steel to 10" square tube steel, deleted brace - revised per PCR HP618, incomplete construction	O	O PL	1 (2)
F970	No tag on hanger, hanger partially installed - incomplete work	R PL	O PL	1 (2)
F971	No tag on hanger - acceptable	R	R	1 (1)
F972	No tag on hanger - acceptable	R	R	1 (1)
F973	Installed pipe guide not shown on piping isometric - temporary supports	O PL	O PL	1 (2)
F974	Piping not insulated - incomplete work	R PL	O PL	1 (2)
F975	Hanger not installed, no hanger drawing - redesign in process	C	C	1 (2)
F976	Wrong azimuth designated on piping isometric - wrong on drawing, ECN	R PL	O PL	32
F977	No tag on hanger - acceptable	R	R	1 (1)
F978	Loose hanger clamp with no rod and no number - temporary hanger	R PL	O PL	1 (2)
F979	Pipe guide not on piping isometric, no drawing for pipe guide - temporary supports	O PL	O PL	1 (2)
F980	Pipe guide not on piping isometric, no drawing for pipe guide - temporary supports	O PL	O PL	1 (2)
F981	Piping has not been insulated - incomplte work	R PL	O PL	1 (2)
F982	Platform installed in location different from that designated - on "out of function" drawing, ECN	R	R	34
F983	Coupling designated 1" x 12", not 1" x 1/2" on drawing - drafting error, ECN	R	R PL	32
F984	Hanger not installed, no hanger drawing, hanger not on isometric, hanger on piping drawing - hanger not in analysis, ECN	R PL	R PL	34
F985	Hanger not installed, no hanger drawing, hanger not on isometric, hanger on piping drawing - hanger not in analysis, ECN	O PL	R PL	34
F986	Hanger not installed, no hanger drawing, hanger not on isometric, hanger on piping drawing - hanger not in analysis, ECN	R PL	C PL	34

		Level 2 Type	Level 3 Type	Frequency
F987	Hanger not installed where shown on piping drawing - "out of function" drawing, ECN	R PL	R PL	36
F988	Hanger not installed where shown on piping drawing - "out of function" drawing, ECN	R PL	R PL	36
F989	Hanger not installed, no hanger on drawing, hanger not on isometric, hanger on piping drawing - hanger not in analysis, ECN	0 PL	0 PL	36
F990	Piping drawing does not show 8" x 6" reducer - reducer part of fabrication	R	R	1 (1)
F991	Piping drawing does not show 8" x 6" reducer - reducer part of fabrication	R	R	1 (1)
F992	Hanger not installed, no hanger on drawing, hanger not on isometric, hanger on piping drawing - hanger not in analysis, ECN	R PL	R PL	36
F993	Piping isometric drawing does not show correct elevation of hanger - "out of function" drawing, ECN	R PL	R PL	36

CATEGORY:

1. Findings which do not require evaluation for determination of corrective action.

1(1) Findings for which B&V and TVA consider there to be no deviation. Information subsequently given by TVA resolved B&V finding (H) and represented a TVA position that no deviation existed with respect to licensing or internal commitments.

Examples:

F134 - Lack of test data for flame test of cable. TVA subsequently provided B&V with existing cable flame test results.

F302 - TFIPE computer program not described in FSAR. TVA subsequently provided B&V with existing licensing submittal letter to NRC.

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.

Examples:

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 program WBN 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 another appropriate category.

1(4) Black and Veatch 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: F303-B&V 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 FSAR.

TVA's method provided for reading time histories from private disk files with traceability accomplished through disk file names, tape numbers used for input and output and internal checks of the computer calculations.

Task Force Conclusion: Finding F303 is not a deviation. Although B&V's recommended approach is relatively easier to follow, the TVA method is fully auditable and therefore satisfies the licensing bases. Therefore the TVA approach is adequate.

F763 - B&V identified a support containing a sway strut which appeared to have excessive pin to pin misalignment. Total misalignment was based on measurements taken by B&V inspectors. Concern was stated that binding of pinned sway strut could occur.

Task Force Conclusion: Based on field measurements taken by Construction Field Engineers on April 28, 1983, strut misalignment falls within +6° alignment tolerance as required by TVA General Construction Spec G-43. B&V's use of a concrete surface as a reference line for measuring strut misalignment accounts for differing task force conclusion.

No further action is required.

2. This category has been eliminated and all findings placed in other categories.

3. Logic/control drawings do not agree with electrical drawings - NCR [redacted].

4. Failure to design/maintain design records as specifically described in FSAR - NCRs [redacted].

5. Procurement forms and flow diagrams specified different requirements for various valves - NCRs [redacted].

6. Discrepancies between design documents (analysis results, load tables, isometric drawings, flow diagrams, etc.) used in the design of piping systems - NCRs [redacted].

7. Nonconforming conditions in construction of previously inspected and accepted pipe supports - NCRs 4434R (R1), 4455R (R0), 4486R (R0), 4335R (R0), 4481R (R0), 4478R (R0), 4480R (R0), [redacted], 4164R.

8. This item has been reassigned to Note 4.

9. Failure to adequately control and evaluate embedded plate capacity when multiple attachments were made to the plate by Construction - NCR [redacted].

10. This item has been reassigned to Note 7.

11. Inadequate documentation of operational modes data used in the analyses of piping systems - NCR [redacted].

12. Failure by EN DES and CONST to properly implement and document the alternate analysis criteria for seismically supported piping - NCRs [redacted].

13. Termination information on the documentation was in error and was not updated to reflect the actual configuration - NCR 4342R.

14. Various supports on the AFW systems have not been modified, redesigned, or initially designed per revised analysis of ECN 2576 - NCR [redacted] R1.

15. This item has been reassigned to Note 6.

16. This item has been reassigned to Note 6.

17. This item has been reassigned to Note 7.

18. A technical note on a piping support drawing (47A050-1T Note 3) was found to be invalid for some applications - NCR [redacted].

19. Equipment cannot be determined to be environmentally qualified to NUREG-0588 - NCRs [redacted].

20. No procedure for documenting time delay relay settings that are determined by preoperational tests and the preoperational test did not identify or require the documenting of these settings - NCR [redacted].

21. This item has been reassigned to Note 4.

22. This item has been reassigned to Note 32.

23. The auxiliary feed pump turbine trip and throttle valve FCV-1-31 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 - NCR [redacted].

24. This item has been reassigned to Note 19.

25. Flange evaluations were omitted in some analysis calculations - NCR [redacted] R1.

26. These items have been reassigned to Note 6.

27. This item has been reassigned to Note 4.

28. This item has been reassigned to Note 6.

29. This item has been split and reassigned to Notes 7 and 12.

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.

31. Editorial discrepancies in licensing documents.

32. Incompatible hanger drawings and piping isometrics - NCR WBRSMP8248.

33. Inadequate cable tagging.

34. "Out of function" feature of a drawing was not in agreement with the lastest design drawing showing the detailed design of the "out of function" feature.

35. Instantaneous trip setting for motor-operated valve breakers is not in accordance with BN MES criteria and vendor recommendations.

36. 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.

37. 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.

38. Evaluation to determine if design of thermal overload bypass circuits met requirements of commitments to RG 1.106 and IEEE 279-1971.

39. The specific configuration of 6.9-kV bundled cables in trays has not been tested for the effects of fire retardant coating on the capacity of the cable.

TABLE 2

FINAL CATEGORIES AND ASSOCIATED B&V FINDINGS

TASK FORCE CATEGORY	CATEGORY DESCRIPTION	B&V 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, F127, F129, F130, F131, F141, F802, F803, F804, F805, F806
4	Failure to design/maintain design records for AFW system as specifically described in FSAR	F118, F121, F303, F304, F305, F306, F309, F313, F502, F504, F511, F513
5	Procurement forms & flow diagrams specified different requirements for various valves	F307, F308, F314, F328, F335, F336, F894, F895, F896, F897
6	Discrepancies between design documents (analysis results, load tables, isometric drawings, flow diagrams, etc.) used in the design of piping systems	F310, F319, F324, F325, F346 F571, F868
7	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, F920
9	Failure to adequately control and evaluate embedded plate capacity when multiple attachments were made to the plate by CONST	F506, F710, F711, F712, F713, F724R1, F730R1, F731R1
11	Inadequate documentation of operational modes data used in the analyses of piping systems	F331, F373
12	Failure by EN DES & CONST to properly implement and document the alternate analysis criteria for seismically supported piping	F347
13	Termination information on the documentation was in error and was not updated to reflect the actual configuration	F142

TABLE 2

FINAL CATEGORIES AND ASSOCIATED B&V FINDINGS

TASK FORCE CATEGORY	CATEGORY DESCRIPTION	B&V FINDING NOS.
14	Various supports on the AFW systems have not been modified, redesigned, or initially designed per revised analysis of ECN 2576	F369, F371, F756, F767, F783, F784, F788, F794, F845, F853, F855, F899, F911, F949, F950, F951, F955, F958, F963, F964, F965, F821
18	A technical note on a piping support drawing (47A050-IT Note 3) was found to be invalid for some applications	F761
19	Equipment cannot be determined to be environmentally qualified to NUREG-0588	F140, F144
20	No procedure for documenting time delay relay settings that are determined by preoperational tests and the preoperational test did not identify or require the documenting of these 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

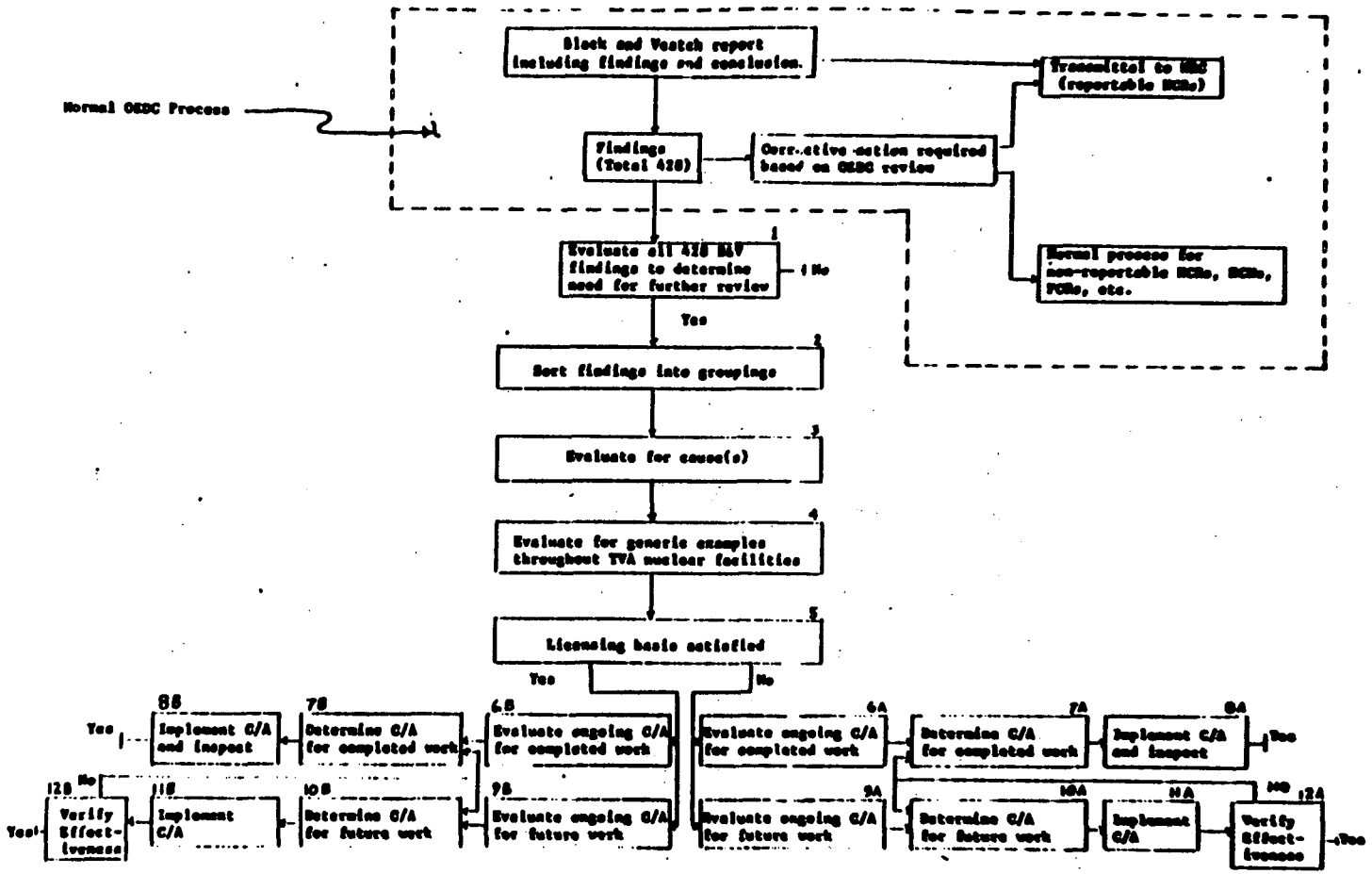
TABLE 2

FINAL CATEGORIES AND ASSOCIATED B&V FINDINGS

TASK FORCE CATEGORY	CATEGORY DESCRIPTION	B&V FINDING NOS.
32	Incompatible hanger drawings and piping isometrics.	F753, F858, F865, F866, F932, F939, F942, F976, F983
33	Inadequate cable tagging.	F807, F809
34	"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
35	Instantaneous trip setting for motor-operated valve breakers is not in accordance with EN DES criteria and vendor recommendations.	F137
36	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
37	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
38	Evaluation to determine if design of thermal overload bypass circuits met requirements of commitments to RG 1.106 and IEEE 279-1971.	F108, F122
39	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

FIGURE 1

FLOWCHART OF EVALUATION STEPS



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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 Nuclear Plant

R. C. McKay, Supervisor, 79-14 Program, Watts Bar Nuclear Plant (Replaced R. W. Olson on March 9, 1983).

APPENDIX B

GUIDELINES FOR COMPLETING EVALUATION

Evaluation Step

1. The task force evaluated 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.) 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 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. The task force developed the category description and listed the related Black and Veatch findings.

NOTE

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 B&V review. By virtue of the unique comprehensiveness of the B&V review, this objective may be satisfied by evaluation of

finding groupings 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 (i.e. EP, QCP level vs. PRM, QAPP, IDAP level). 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:

- 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.

5. 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 an 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.

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. ____
Date ____

1. Task Force Category ____ for _____

2. Task Force Category Description and Related B&V Findings:

3. Evaluation for Cause

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

4. Evaluation for Generic Examples

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

1759

5. Licensing Basis Satisfaction

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7A. Identification of Corrective Action for Completed Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10A. Identification of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

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 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. [signature] 3/14/84 Task Force Concurrence [signature] 3/14/84

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. [signature] 3/14/84 Task Force Concurrence [signature] 3/14/84

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. [signature] 3/6/84 Task Force Concurrence [signature] 3/6/84

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. [signature] 3/6/84 Task Force Concurrence [signature] 3/6/84

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. [signature] 3/6/84 Task Force Concurrence [signature] 3/6/84

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.

Resp. Org. [signature] 3/14/84 Task Force Concurrence [signature] 3/16/84

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. [signature] 3/14/84 Task Force Concurrence [signature] 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. [signature] 3/14/84 Task Force Concurrence [signature] 3/16/84

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final
Training in XN DES EP 4.25 completed on July 28, 1982, for I&C Section.

Resp. Org. [illegible] 8/10/84 Task Force Concurrence [illegible] 3/6/84

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. 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 _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

Corrective action should address all nonsafety systems and should correct drawings on a priority based upon system importance to nuclear safety and plant operability.

B. Final

NA

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

NA

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

B. Final

NA

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

B. Final

NA

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

NA

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 _____ / /

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 WBNP 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 3/9/84

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 units at Watts Bar.

Resp. Org. [signature] 3/16/84 Task Force Concurrence [signature] 3/19/84

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 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. [signature] 3/16/84 Task Force Concurrence [signature] 3/19/84

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. [signature] 3/16/84 Task Force Concurrence [signature] 3/17/84

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. [signature] 3/16/84 Task Force Concurrence [signature] 3/17/84

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. [signature] 3/16/84 Task Force Concurrence [signature] 3/17/84

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

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.

Resp. Org. DTCliff 1 V0184 Task Force Concurrence [signature] 1V0184

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. DTCliff 5/2/83 Task Force Concurrence [signature] 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. Final

The actions described in section 9A 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. DTCliff 5/2/83 Task Force Concurrence [signature] 5/5/83

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. 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.

Resp. Org. DT Clift 1/3/84 Task Force Concurrence [signature] 1/5/84

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

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.

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R2
Date 12/27/83

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. M R Belew 1/19/84 Task Force Concurrence [signature] 1/19/84

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 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. M R Belew 1/19/84 Task Force Concurrence [signature] 1/19/84

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 Belew 1/9/84 Task Force Concurrence [signature] 1/9/84

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 Belew 1/9/84 Task Force Concurrence [signature] 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. M R Belew 1/9/84 Task Force Concurrence [signature] 1/9/84

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

N/A

Resp. Org. M R Bebee 1/9/84 Task Force Concurrence W Lyon 1/9/84

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. M R Bebee 1/9/84 Task Force Concurrence W Lyon 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 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 S1 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 Bebee 1/9/84 Task Force Concurrence W Lyon 1/9/84

11A. 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 [signature] 1/9/84

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

N/A

Resp. Org. MR Below 1/9/84 Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

N/A

Resp. Org. M R Belew 11/9/84 Task Force Concurrence / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

N/A

Resp. Org. M R Belew 11/9/84 Task Force Concurrence / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

N/A

Resp. Org. M R Belew 11/9/84 Task Force Concurrence / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

N/A

Resp. Org. M R Belew 1/9/84 Task Force Concurrence ____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

N/A

Resp. Org. M R Belew 1/9/84 Task Force Concurrence ____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

N/A

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 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: (1a) ineffective handling of the interface region between two analyses and (1b) 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. [signature] 3/15/84 Task Force Concurrence [signature] 3/16/84

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

(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 WBN unit 1. (2) No further evaluation is required, see 3.B.(2) above.

(1a, 1b) 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. [signature] 3/15/84 Task Force Concurrence [signature] 3/16/84

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

(1a, 1b) The licensing basis for these findings is not satisfied. (2) Licensing basis is satisfied.

Resp. Org. [signature] 3/15/84 Task Force Concurrence [signature] 3/16/84

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 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 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 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. [signature] 3/15/84 Task Force Concurrence [signature] 3/16/84

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.

B. Final

The plan in 6A.B. appears adequate.

Resp. Org. [signature] 3/15/84 Task Force Concurrence [signature] 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. R. Gwin 3/15/84 Task Force Concurrence W. Elliott 3/16/84

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. R. Gwin 3/15/84 Task Force Concurrence W. Elliott 3/16/84

10A. Identification of Corrective Action for Future Work

A. Preliminary

B. Final

The action identified in 9A.B appears to be adequate.

Resp. Org. R. Gwin 3/15/84 Task Force Concurrence W. Elliott 3/16/84

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

Refer to 9A.B.

Resp. Org. RC 3/15/84 Task Force Concurrence [signature] 3/16/84

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

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.

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. 02
Date 11/18/83

1. 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. [signature] 4/18/83 Task Force Concurrence [signature] 4/20/83

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 6000-1 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. [signature] 4/18/83 Task Force Concurrence [signature] 4/20/83

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. [signature] 4/18/83 Task Force Concurrence [signature] 4/12/83

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. [signature] 4/18/83 Task Force Concurrence [signature] 4/12/83

7A. Identification of Corrective Action for Completed Work

A. Preliminary

The plan in 6AA is adequate.

B. Final

Concur.

Resp. Org. [signature] 4/18/83 Task Force Concurrence [signature] 4/12/83

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

The implementation of NRC Bulletin OIE 79-14 is required prior to unit fuel loading. This requirement will ensure implementation and inspection of corrective action for completed work.

B. Final

Concur.

Resp. Org. Thomas R Brown 4/18/83 Task Force Concurrence RLT 4/18/83

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 with 9.A. In addition we have corrected the misinterpretation of pipe side welds on B-P drawing through additional training of inspectors.

Resp. Org. Thomas R Brown 4/18/83 Task Force Concurrence 4/20/83

10A. Identification of Corrective Action for Future Work

A. Preliminary

Same comment as 9AA above.

B. Final

Same as 9A.B.

Resp. Org. Thomas R Brown 4/19/83 Task Force Concurrence 4/20/83

11A. Implementation of Corrective Action for Future Work

A. Preliminary

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).

B. Final

Concur.

Resp. Org. [signature] 11/28/83 Task Force Concurrence [signature] 11/28/83

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

Implementation of Phase II of the 79-14 program will verify the final design and acceptance of the hangers.

B. Final

Concur. Audits by other gorups will strengthen this program also. No further action required on this Black & Veatch category. This item is closed.

Resp. Org. [signature] 4/19/83 Task Force Concurrence [signature] 4/19/83

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. / / Task Force Concurrence / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R2
Date 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.

4J Resp. Org. WBP 7/20/83 A. Johnson 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.

4J Resp. Org. WBP 7/20/83 A. Johnson 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 inadequate.

AJ Resp. Org. WBP 1/31/84 ~~1/29/84~~ AJ Task Force Concurrence 1/31/84
A. Jonsson 7 Feb 83

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.

AJ Resp. Org. WBP 7/20/83 Task Force Concurrence 7 Feb 83
A. Jonsson

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.

AJ Resp. Org. WBP 7/20/83 Task Force Concurrence 7 Feb 83
A. Jonsson

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.

AJ Resp. Org. WBP 7/20/83 A. Johnson Task Force Concurrence [signature] 7/24/83

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 A. Johnson Task Force Concurrence [signature] 7/24/83

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 A. Johnson Task Force Concurrence [signature] 7/24/83

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. 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 M3C-928 will ensure adequate resolution of this category.

Resp. Org. A. Johnson 12/7/83 Task Force Concurrence [signature] 12/5/83

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

1347

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

TVA Task Force for
Review of Black &
Veatch Findings

EVALUATION SHEET

Rev. R2
Date 12/27/83

1. Task Force Category 11 for Watts Bar Nuclear 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. [signature] 12/29/83 Task Force Concurrence [signature] 1/5/84

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 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 completed.

Resp. Org. [signature] 12/29/83 Task Force Concurrence [signature] 1/5/84

5. Licensing Basis Satisfaction

A. Preliminary

The licensing basis is not satisfied.

B. Final

The licensing basis is not satisfied.

Resp. Org. [redacted] 12/29/83 Task Force Concurrence [redacted] 1/5/84

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

NCR WBNCEB 8215 and EN DES SEP 82-15 address the findings. SEP 82-15 does not adequately address the generic implications referred to in 4A.

B. Final

NCR WBNCEB 8215 and EN 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. [redacted] 12/29/83 Task Force Concurrence [redacted] 1/5/84

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) reanalysis 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. [redacted] 12/29/83 Task Force Concurrence [redacted] 1/5/84

8A. 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 SIS remains to be completed. This entire effort is being tracked through NCR WBNCEB8215.

Resp. Org. PSW [signature] 12/29/83 Task Force Concurrence [signature] 1/5/84

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. PSW [signature] 12/29/83 Task Force Concurrence [signature] 1/5/84

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 WBN sampling program is completed.)

See Continuation Sheet (page 7).

Resp. Org. PSW [signature] 12/29/83 Task Force Concurrence [signature] 1/5/84

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

Refer to 9A.B. Retrievable operational modes documents will be developed by 1/30/86. This effort is being tracked through NCR WBNCEB8215.

Resp. Org. [signature] 12/27/85 Task Force Concurrence [signature] 1/5/84

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

2. Failure to adequately train personnel.

3. Inadequate quality assurance Program.

C. RECOMMENDATIONS

1. SWP 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 (CEB 76-5).

3. 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 ANALYTICAL TECHNIQUES

A. WEAKNESSES:

Same as documentation weaknesses before.

B. ROOT CAUSE(S):

Same as documentation basic root cause before.

C. RECOMMENDATIONS:

1. Use 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 nozzle loads, and effect of end point movements.
   b. Consider effect of thermal expansion load on supports and anchors 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 conservatism built in CEB 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.

THIS IS NOT SO FOR SMP GENERATED PIPING TEL

4.0 DESIGN DATA TRANSFER

A. WEAKNESSES

1. 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. RECOMMENDATIONS

1. Recommend that EN 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.
2. Recommend that piping analysis operating mode data drawings be developed, issued, and maintained.
3. 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

[redacted]

far more than the cost of special replacement hardware orders of identical items and/or the cost of reanalysis itself.

5. Recommend that all software computer programs have a quality assured verification, authorization, and notification program administered.

6. Recommend that the above data transfer recommendations be given top priority of implementation and completion.

5.0 ORGANIZATIONAL EFFECTIVENESS

A. WEAKNESSES:

1. Lack of communication and coordination between SWP, CEB, and CONST.
2. Lack of training within CEB, SWP and CONST.
3. Inadequate analysis result.

B. ROOT CAUSES:

1. Division of Construction, not sufficiently trained to perform design work, was given the full responsibility by SWP to perform design work without EN 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.
3. CEB failed to provide SWP sufficient training and guidance to implement the use of the Alternate Analysis Criteria 76-5 developed by EDS.

4. CEB has not reviewed in detail the technical requirements, limitations, and practical application of the criteria before issuing to SWP for use.
5. CEB not responsive to SWP's need to make deviation to the criteria for reason that CEB has to get EDS approval.
6. CEB (the lead organization) failed to audit 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 RECOMMENDATION

1. Analysis performed by construction must be reviewed and approved by EN DES.
2. Form a section (alternate analysis) in SWP similar to RLP and YCP to handle the following:
   a. Reanalyze and document all alternate analysis problems in question.
   b. Review and approve all variances to the alternate analysis.
   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.)

TO: J. C. Key, 207 GB-K — DATE: 6/24/82

W. A. English, W9C126 C-K

FROM: Jack B. Thomison — EXTENSION: 3550

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.

Jack B. Thomison

JBT:DB
Attachment

FOR

FROM

WATTS BAR NUCLEAR PLANT - ALTERNATE ANALYSIS REVIEW

JCK:WAE:DB
cc(Attachment):
R. O. Barnett, W9D224 C-K
J. C. Standifer, 204 GB-K

*The attached report identifies root causes of problems found in the implementation of the alternate analysis program and contains recommendations to correct the discrepancies found.

We recommend that the recommendations be implemented to the extent feasible with status reports made periodically until all recommended actions are complete.

JCS:DB
cc (Att): R. A. Costner, W11C126 C-K
J. A. Raulston, W10C126 C-K
O. P. Thornton, 102 SPT-K

TVA 450 (08-83) INTEROFFICE MAILING SLIP

Jack B. Thomison

:DB
Attachment

TVA 450 (08-83) INTEROFFICE MAILING SLIP

[redacted]

[redacted]

Xc

RCP

FINDINGS

OF THE

ALTERNATE ANALYSIS REVIEW TEAM

FOR

WATTS BAR NUCLEAR PLANT

J. B. Thomison

S. D. McMahan

[illegible]

A62173.20

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.

3. No Approved Analysis Procedures:

   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 conservatisms.

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 WBN 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 conservatisms so that excessive rework can be avoided. Where possible, sections of the report dealing with branches, tees, bends, valves, axial 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 SHEET

Rev. R1
Date 4/6/83

1. Task Force Category 13 for Watts Bar Nuclear 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: F142.

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. Ed Burke 4/18/83 Task Force Concurrence [signature] 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 Burke 4/18/83 Task Force Concurrence [signature] 4/20/83

5. Licensing Basis Satisfaction

A. Preliminary

The example identified thus far satisfied the licensing basis. Until 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.

Resp. Org. Ed Burke 4/18/83 Task Force Concurrence [signature] 4/21/83

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.A.

Resp. Org. Ed Burke 4/18/83 Task Force Concurrence [signature] 4/21/83

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 Burke 4/18/83 Task Force Concurrence [signature] 4/21/83

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

No action required.

Resp. Org. Ed Runk 9/16/83 Task Force Concurrence [signature] 4/22/83

9A. Identification and Evaluation of Ongoing Corrective Action for Future 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.A.

Resp. Org. Ed Runk 9/18/83 Task Force Concurrence [signature] 4/22/83

10A. Identification of Corrective Action for Future Work

A. Preliminary

B. Final

No action required.

Resp. Org. Ed Runk 9/18/83 Task Force Concurrence [signature] 4/22/83

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

No action required.

Resp. Org. Ed Burke 9/16/83 Task Force Concurrence [signature] 4/12/83

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

No action required.

Resp. Org. Ed Burke 9/16/83 Task Force Concurrence [signature] 4/12/83

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. Ed Burke 4/19/83 Task Force Concurrence / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / _____ Task Force Concurrence _____ / / _____

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / _____ Task Force Concurrence _____ / / _____

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / _____ Task Force Concurrence _____ / / _____

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R1
Date 12/22/83

1. Task Force Category 14 for Watts Bar Nuclear Plant - Unit 1

2. 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 ECN 2576: F369, F371, F756, F767, F783, F784, F788, F794, F845, F853, F855, F899, F911, F949, F950, F951, F955, F958, F963, F964, F965, and F821.

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. JJMoak 1/13/84 Task Force Concurrence [signature] 1/15/84

4. Evaluation for Generic Examples

A. Preliminary

Since all unit 1 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. Final

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. JJMoak 1/13/84 Task Force Concurrence [signature] 1/15/84

5. Licensing Basis Satisfaction

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 ECN 2576, resulting in the licensing basis not being satisfied. These discrepancies have been handled under ECN 3511 to satisfy the licensing basis for AFW. All discrepancies found per the review made in step 4.B will be completed under ECN 4080 by 12/30/83 to satisfy the licensing basis for all systems.

Resp. Org. JJ Noah 1/3/84 Task Force Concurrence [illegible] 1/5/84

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

WBN 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

NCR WBNSWP8301 was written against B&V findings on the auxiliary feedwater system. All changes required on auxiliary feedwater supports have been made under ECN 3511. All systems have been reviewed for implementation of ECN 2576 and ECN 3184. Any discrepancies found per this review will be resolved under ECN 4080.

Resp. Org. JJ Noah 1/3/84 Task Force Concurrence [illegible] 1/5/84

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 ECN 2576 and ECN 3184 will be completed per the disposition of NCR WBNSWP8301 under ECN 4080 by 12/30/83.

Resp. Org. JJ Noah 1/3/84 Task Force Concurrence [illegible] 1/5/84

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

Any remaining work required under ECN 4080 will be tracked per the dispostion of NCR WBNSWP8301 under CTR WBN E-361.

Resp. Org. JJ Mack 1/3/84 Task Force Concurrence [signature] 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. JJ Mack 1/3/84 Task Force Concurrence [signature] 1/5/84

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 SKPs.

B. Final

All future ECNs on WBP will be written for a single unit only, therefore, eliminating much of the problem that occurred with ECN 2576. To prevent recurrence the review of analysis isometrics and load tables per the scope of the ECN have been upgraded to formal calculation packages requiring appropriate documentation. This upgrading and documentation per the scope of the ECN are requirements that have been incorporated into WBP-EP 43.14.

Resp. Org. JJ Mack 1/3/84 Task Force Concurrence [signature] 1/5/84

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final
All future evaluations of analysis isometrics and load tables, revised per reanalysis, will be performed using standard evaluation sheets in accordance with WEP-EP 43.14 issued 8-22-83 (ESB 830822 202). This evaluation procedure will ensure that no support revisions are overlooked. Each evaluation package will be considered a formal calculation package and will be microfilmed as such.

Resp. Org. JJ Mark 1/13/84 Task Force Concurrence [illegible] 1/15/84

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

WBP '83 1214 001

TO : WBP Files

FROM : R. L. Ilich, 375 GB-K

DATE : DEC 14 1983

SUBJECT: WATTS BAR NUCLEAR PLANT UNIT 1 - DOCUMENTATION SUMMARY FOR BLACK AND VEATCH TASK FORCE CATEGORY 14 COMMITMENT ASSOCIATED WITH NCR WBNSWP8301

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.

M23342.03

WBP Files

DEC 14 1983

WATTS BAR NUCLEAR PLANT UNIT 1 - DOCUMENTATION SUMMARY FOR BLACK AND VEATCH TASK FORCE CATEGORY 14 COMMITMENT ASSOCIATED WITH NCR WBNSWP8301

The review for ECNs 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.

M23342.03

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WBP Files
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WATTS BAR NUCLEAR PLANT UNIT 1 - DOCUMENTATION SUMMARY FOR BLACK AND VEATCH TASK FORCE CATEGORY 14 COMMITMENT ASSOCIATED WITH NCR WBNSWP8301

Conclusions

The reviews which have been done for ECNs 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 ECN 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 EN 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 nine-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.

J. C. Standifer

R. L. Ilich

ILI:CDP
cc: J. C. Standifer, 204 GB-K

12/ /83 - JCS:CDP
cc: MEDS, W5B63 C-K
M. N. Sprouse, W11A9 C-K

M23342.03

ATTACHMENT 1

ECN	SUPPORT NO.	SYSTEM	DESCRIPTION OF DEFICIENCY	EFFECTS ON PIPING SYSTEM
2576	26-1FP-R231	Fire Prot.	Support load increased by 100# in the negative Y direction and by 50# in positive Y dir. Support was not designed to restrain the positive Y dir. load.	The induced stress on an 8" dia. pipe caused by a 50# load can be considered negligible. The reserve stress in the pipe is 10,700 psi, therefore, a pipe failure would not have occurred.
2576	47A491-8-11	Fire Prot.	Support was not designed to a restrain 50 lb. lateral load.	The induced stress on the 1-1/2 dia. pipe would not be significant based on location of adjacent supports. The reserve stress in the pipe is 9,900 psi, therefore, a pipe failure would not have occurred.
2576	70-1CC-R246	Comp. Cooling	Support restrains the pipe and the piping is analyzed assuming 1/10-inch movement in the Y direction with no restraint.	This support had a 1/16-inch gap provided in the Y direction and the movement of 1/10-inch is a rounded value. Assuming no gap present the thermal stress would be high, however, the reserve stress is 13,500 psi. We feel a pipe failure would not have occurred.
2576	70-1CC-V127	Comp. Cooling	Support load changed from 98 lbs. to 31 lbs. on a 4-inch diameter pipe. The existing variable spring used for the support would not accommodate a load less than 59 lbs.	The induced stress on the 3-inch dia. pipe caused by a 67-lb. preload would not be significant. The reserve stress in the pipe is 14,2 psi, therefore, a pipe failure would not have occurred.

M13343.01

ATTACHMENT 1

ECN	SUPPORT NO.	SYSTEM	DESCRIPTION OF DEFICIENCY	EFFECTS 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 addit. unrestrained 590-lb. load would b. picked up by adjacent supports. 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 suppo. 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 is 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 is 11,264 psi. We feel a pipe failure would not have occurred.
3184	47A406-8-19	Chem. & Vol. 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 shim plate will be added to lower the induced stress.

M13343.01

ATTACHMENT NO. 2

ECN	MECH. SECTION	WPDS NO.
2576	#3	WBP 830810 072 thru WBP 830810 101 WBP 831027 030 thru WBP 831027 045 WBP 831101 038
2576	#4	WBP 831024 053
2576	#1	WBP 831107 019
2576	#2	WBP 831103 045
3184	#1	WBP 831107 020
3184	#2	WBP 831103 044
3184	#3	WBP 831027 029
3184	#4	WBP 831024 054

M13343.02

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 1

2. Task Force Category Description and Related B&V 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

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 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.

Resp. Org. R. D. Pratt 9/15/83 Task Force Concurrence [signature] 11-1-83

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 existance of calculations will determine if other examples 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. 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. Pratt 10/24/83 Task Force Concurrence [signature] 11/1/83

5. Licensing Basis Satisfaction

A. Preliminary

Licensing basis impact cannot be determined until all examples of deviations are identified and evaluated.

B. Final

~~Same as 5.A.~~ 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.D.Pratt 4/15/83 R.D.Pratt 11/9/83 Task Force Concurrence 11/10/83

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" ∅ 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 CONST requesting them to verify whether the note has been used. If the note was used, CONST 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. R.D.Pratt 5/3/83 Task Force Concurrence 11/10/83

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.

Resp. Org. R.D.Pratt 11/4/83 Task Force Concurrence 11/10/83

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final
CONST has completed its inspection of all supports identified by EN DES (see WEP 830429 032 and WBN 830523 005). Of the 22 supports identified to CONST, the substitution of welds for anchor bolts was made on 5 supports. Review of the detailed calculations for these supports determined the installations are adequate.

Resp. Org. R.D. Pratt 11/6/83 Task Force Concurrence [signature] 11/10/83

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" ∅ 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 (M3C-928) will require a detailed review of connections of this nature.

Resp. Org. R.D. Pratt 11/4/83 Task Force Concurrence [signature] 11/10/83

10A. Identification of Corrective Action for Future Work

A. Preliminary

- Revise EN DES KP-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 KPs 3.03 and 4.25.

B. Final

The plan in 9.A.B is adequate.

Resp. Org. R.D. Pratt 5/3/83 Task Force Concurrence [signature] 11/10/83

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final - Drawing 47A050-IT, note 3 was revised as follows (revision 2): "Where a surface mounted base plate with anchor bolts 7/8" diameter or less overlaps an embedded plate, and that one or more of the anchors cannot be installed, the anchor bolts in the way of the embedded plate may be omitted if at least 2" of 5/16" fillet weld between the surface mounted base plate and the embedded plate is provided for each omitted anchor bolt. The weld must come to or cross at least one centerline of the omitted bolt and meet requirement of specification M3C-928 and G32. This note applies to WB, SSD, SFD and GROUTED Bolts only."

Resp. Org. R.D.Pratt 6/27/83 Task Force Concurrence 11/4/83

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. 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 Watts Bar Nuclear Plant - Unit 1

2. Task Force Category Description and Related B&V Findings:

Equipment cannot be determined to be environmentally qualified to NUREG-0588: F140 and F144.

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 recognize the need to systematically environmentally qualify equipment for postulated accidents.

Resp. Org. MR Rehm 6/2/83 Task Force Concurrence [signature] 6/6/83

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 AFW system. The EN DES equipment qualification program under NUREG-0588 prescribes an adequate approach to identify generic examples for WBN 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 NUREG-0588 prescribes an adequate approach to identify generic examples for WBN Unit 1.

Resp. Org. MR Rehm 6/2/83 Task Force Concurrence [signature] 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. MR Belew 6/3/83 Task Force Concurrence [signature] 6/6/83

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 Belew 6/3/83 Task Force Concurrence [signature] 6/6/83

7A. Identification of Corrective Action for Completed Work

A. Preliminary

The EN 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. MR Belew 6/3/83 Task Force Concurrence [signature] 6/6/83

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

Our engineering procedures and our NUREG 0588 program are adequate to assure proper handling of systems important to safety.

Resp. Org. MR Belvin 6/3/83 Task Force Concurrence [signature] 7/26/83

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

The Task Force is not aware of any action.

B. Final

Presently there is no identified program to ensure implementation of corrective action for future work. However, a nonconformance report GENQAB 8204 has been written on this problem. The Nuclear Engineering Branch is to resolve this nonconformance report.

2/13/84 SDD

Resp. Org. MRB Belvin 6/3/83 Task Force Concurrence [signature] 6/6/83

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. MR Belvin 2/22/84 Task Force Concurrence [signature] 2/23/84

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

See item 10A.

Resp. Org. MR Baker 2/12/87 Task Force Concurrence [signature] 2/13/87

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

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:

1. The completed, current and future activities related to IEB79-01B, NUREG-0558, and 10CFR50.49,
2. Any new system that may be added to a plant environmental zone or [illegible],
3. The procurement of any safety-related component by EN DES or NUC PR and,
4. 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:

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 dependant 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 NCR (if one is issued)

(B*) To cover review for impact on existing system components, etc., resulting from new system additions in an existing environmental zone

(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 fo Documents Affecting Quality (EP-1.28)
3. TVA Memorandums 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)
8. 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 EN DES Drawings (EP-4.01)
11. Engineering Change Notices (ECN's) before Licensing - Handling (EP-4.02)
12. Field change Requests Initiated by NUC PR (EP-4.06)
13. Design change Requests (DCR's) - Processing, Reviewing, and Approving (EP-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)
18. Release of QA Items from Suppliers' Shops to Construction Site (EP-5.43)

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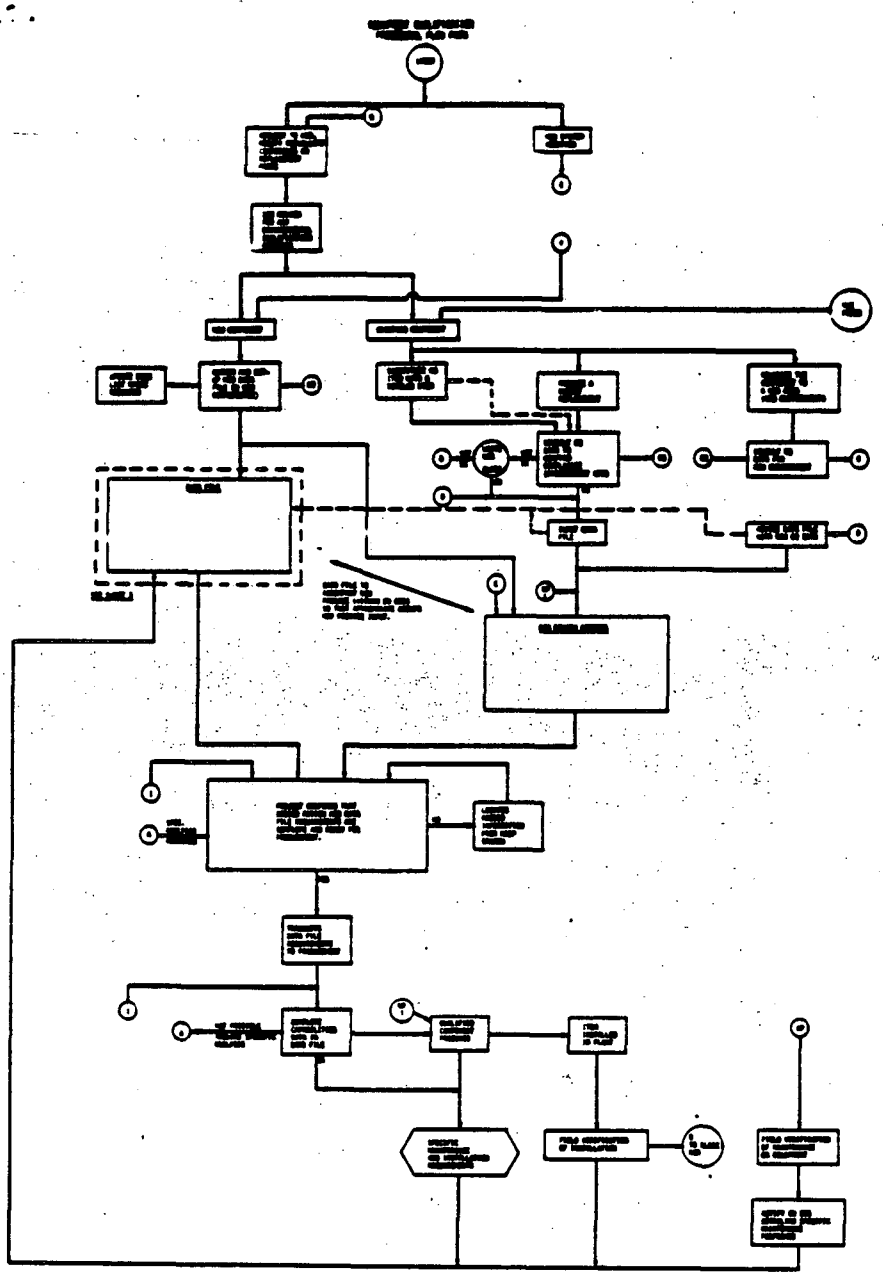

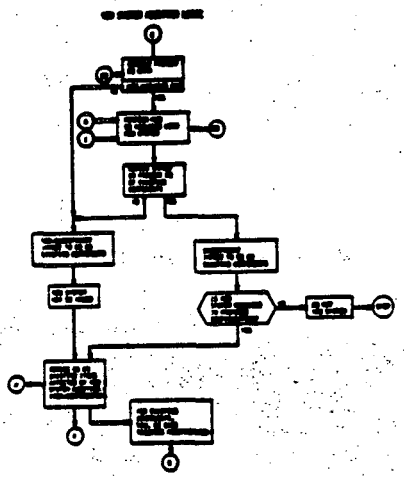

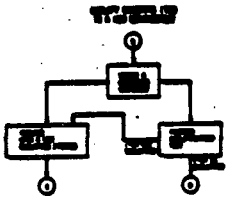

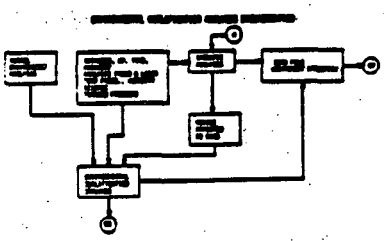

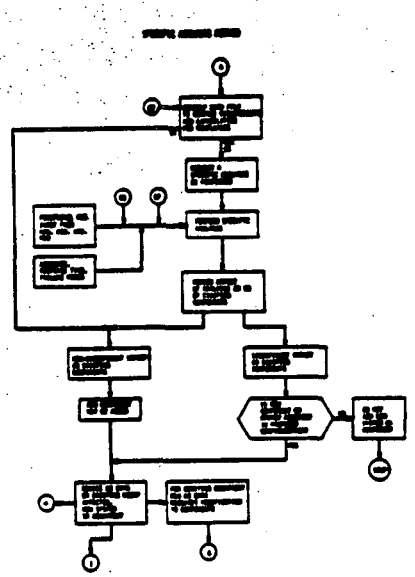

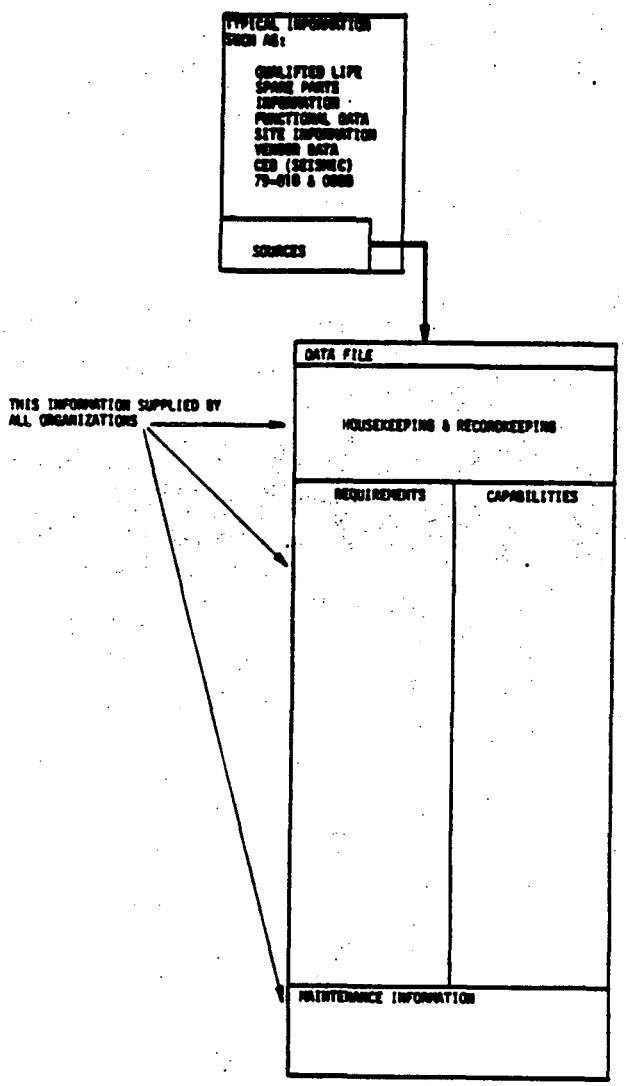
TYPICAL INFORMATION
SUCH AS:
QUALIFIED LIFE
SPARE PARTS
INFORMATION
FUNCTIONAL DATA
SITE INFORMATION
VENDOR DATA
CEB (SEISMIC)
79-010 & 0088
SOURCES
DATA FILE
THIS INFORMATION SUPPLIED BY
ALL ORGANIZATIONS
HOUSEKEEPING & RECORDKEEPING
REQUIREMENTS
CAPABILITIES
MAINTENANCE INFORMATION

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 Nuclear Plant - Unit 1

2. 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 reqire 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. Below 7/13/83 Task Force Concurrence 8/29/83
D.K. Payano 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. Below 7/13/83 Task Force Concurrence 8/29/83
D.K. Payano 8-29-83

5. Licensing Basis Satisfaction

A. Preliminary

The licensing basis for these time delay relays was not satisfied.

B. Final

~~Same as above.~~ 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.

Resp. Org. M. R. Belew 7/13/83 M R Belew 3/6/84 A Z Poyser 8/29/83 Task Force Concurrence 3/6/84 8/29/83

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

The NCR WBNEEB 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 (EEB 830614 939) was written to document the relay settings.

Resp. Org. M. R. Belew 7/13/83 A Z. Poyser 8/29/83 Task Force Concurrence 8/29/83

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 A Z. Poyser 8/29/83 Task Force Concurrence 8/29/83

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 (KKB 830614 939) were adequately documented. ~~Same as above.~~ Preop test TVA-22 scoping document has been changed (see Continuation Sheet)

M R Below 7/14/83

Resp. Org. M. R. Below 7/13/83 Task Force Concurrence 11/10/83

A.T. Payne 8-23-83

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 preoperational tests.

Resp. Org. M. R. Below 7/13/83 Task Force Concurrence 8/17/83

A.T. Payne 8-23-83

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. M. R. Below 7/13/83 Task Force Concurrence 8/17/83

A.T. Payne 8-23-83

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

EN DES-SEP 83-11 (EER 831014 937) has been issued.

Resp. Org. MR Bebar 11/10/83 Task Force Concurrence 11/10/83

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

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. 81
Date 8/25/83

1. Task Force Category 23 for Watts Bar Nuclear Plant - Unit 1

2. Task Force Category Description and Related 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

Lack of control during the determination of safety-related equipment. This process did not employ design verification.

B. Final

The failure to include the auxiliary feedwater turbine trip and throttle valve FCV-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 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. DT Clyde 9/1/83 Task Force Concurrence [signature] 9/1/83

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. DT Clyde 9/1/83 Task Force Concurrence [signature] 9/1/83

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. Final

Since corrective action will be taken to modify valve FCV-1-51, the licensing basis for the plant has been satisfied.

Resp. Org. DTClapp 9/1/83 Task Force Concurrence [signature] 9/1/83

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. DTClapp 9/1/83 Task Force Concurrence [signature] 9/1/83

7A. Identification of Corrective Action for Completed Work

A. Preliminary

NEB 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. 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 and Veatch finding as identified in WBN ECN 3642.

Resp. Org. DTClapp 9/1/83 Task Force Concurrence [signature] 9/1/83

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

WBN ECN-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. D T Clift 9/1/83 Task Force Concurrence W J ... 9/1/83

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. D T Clift 9/1/83 Task Force Concurrence W J ... 9/1/83

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. 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 EN DES by EP 2.10 and are identified on the TROI systems for tracking purposes.

Resp. Org. D T Clift 9/1/83 D. T. Clift ~~9/12/83~~ Task Force Concurrence W J ... 9/1/83

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

Implementing corrective action on future work will be handled by issued procedures within EN DES (such as NCRs, ECN, and etc.) Item 10 addresses how the list will be maintained current as the design progresses.

Resp. Org. DT Chief 9/11/83 Task Force Concurrence [signature] 9/11/83

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R1
Date 8/24/83

1. Task Force Category 25 for Watts Bar Nuclear Plant - Unit 1

2. Task Force Category Description and Related B&V Findings:

Flange evaluations were omitted in some analysis calculations: F322.

3. Evaluation for Cause

A. Preliminary

Flange 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 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. [signature] 9/12/83 Task Force Concurrence [signature] 9/13/83

4. Evaluation for Generic Examples

A. Preliminary

Flange qualification needs to be reviewed for all rigorous analysis problems for WBN 1.

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 nine problems have been identified for which the flanges qualification had not been documented in the analysis.

Resp. Org. [signature] 9/12/83 Task Force Concurrence [signature] 9/13/83

5. Licensing Basis Satisfaction

A. Preliminary

The licensing basis was satisfied for the two deviations identified by B&V. 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.B., 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. [redacted] 9/12/83 Task Force Concurrence [redacted] 9/13/83

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

The current planned corrective action for WBNCEB 8222 (not yet documented) appears acceptable to identify and correct all examples at WBN 1.

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. [redacted] 9/12/83 Task Force Concurrence [redacted] 9/13/83

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. [redacted] 9/12/83 Task Force Concurrence [redacted] 9/13/83

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

A 100 percent review of all problems has been completed. Nine 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 upgraded by August 31, 1983.

Resp. Org. [signature] 9/12/83 Task Force Concurrence [signature] 9/13/83

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 WEM rigorous analysis handbook.

Resp. Org. [signature] 9/12/83 Task Force Concurrence [signature] 9/13/83

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 9A.B appears to be adequate.

Resp. Org. [signature] 9/12/83 Task Force Concurrence [signature] 9/13/83

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

A checklist which includes requirements for proper flange qualification and documentation has been incorporated into the WBN rigorous analysis manual. and Stds

Resp. Org. [signature] 9/13/83 Task Force Concurrence [signature] 9/13/83

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R2
Date ~~2/14/83~~ 3/19/84

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 pump 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.

B. Final
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 EN DES personnel.

Resp. Org. G. D. Collins 8/25/83 Task Force Concurrence 8/26/83

4. Evaluation for Generic Examples

A. Preliminary

1) and 2) A review needs to be performed of all WBNP 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 ~~EN DES (EEB) prepares~~ 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 example of failure to electrically protect devices: 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. G. D. Collins 8/25/83 G. D. Collins 3/19/84 Task Force Concurrence 8/26/83 3/19/84

5. Licensing Basis Satisfaction

A. Preliminary
1) The licensing basis was not satisfied since the MD 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.

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. G.D. Collins 8/25/83 Task Force Concurrence [signature] 8/26/83

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. This is appropriate except that it does not cover generic examples.

B. Final
1) ECN 3827 added MD AFW lube oil pump to status monitoring (Ref: EN DES response to finding F-100).
2) ECN 3636 referenced F-136. It also included generic examples specified in 4A.

Resp. Org. G.D. Collins 8/25/83 Task Force Concurrence [signature] 8/26/83

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 ~~if~~ is complete. ~~EEB will provide schedule regarding preparation and issue of procedure.~~
2) Generic deviations included in ECN 3636.

Resp. Org. G.D. Collins 8/25/83 Task Force Concurrence [signature] 8/26/83
G.D. Collins 3/19/84 [signature] 3/19/84

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final
(1) CTR R293 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. G.D. Collins 3/19/84 Task Force Concurrence [signature] 3/19/84

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 the Office of Power and Engineering
1) Procedure 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, 1983 (NEB 820226 255).
2) Engineering Procedures Training and Utilization Program initiated by M. N. Sprouse to Those listed dated February 26, 1982 (NEB 820226 255).

Resp. Org. G.D. Collins 8/25/83 Task Force Concurrence [signature] 8/26/83
G.D. Collins 3/19/84 [signature] 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) Same as (2).
2) None necessary due to ongoing corrective action specified in 9A.

Resp. Org. G.D. Collins 8/25/83 Task Force Concurrence [signature] 8/26/83

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

(1) CTR R293 will track the completion of issuing a procedure to ensure that any equipment changed in the future is reviewed for compliance to status monitoring requirements of RG 1.47.
(2) The completion of training is an ongoing program that is required by M. N. Sprouse's memorandum to Those listed dated February 26, 1982 (NEB 820226 255).

Resp. Org. [signature] 3/19/84 Task Force Concurrence [signature] 3/17/84

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R1
Date 4/27/83

1. Task Force Category 31 for Watts Bar Nuclear Plant - Unit 1

2. Task Force Category Description and Related B&V Findings: Editorial discrepancies in licensing documents: F119 and F321.

3. Evaluation for Cause

A. Preliminary

The preparation process and checking through OEDC and Power Regulatory Staff did not identify and correct all editorial discrepancies.

B. Final

Both findings describe FSAR errors that are editorial in nature.

Resp. Org. DTCliff 4/27/83 Task Force Concurrence [signature] 4/27/83

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.

Resp. Org. DTCliff 4/27/83 Task Force Concurrence [signature] 4/27/83

5. Licensing Basis Satisfaction

A. Preliminary

The editorial nature of the FSAR errors does not jeopardize the licensing basis defined in the FSAR. Therefore, no further action required.

B. 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 type.

This assessment is applicable to both units at Watts Bar.

Resp. Org. DT Clyff 4/27/83 Task Force Concurrence [signature] 4/27/83

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7A. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10A. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11A. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

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10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R3
Date 12/19/83

1. Task Force Category 12 for Watts Bar Nuclear Plant - Unit 1

2. Task Force Category Description and Related B&V Findings: Incompatible nonelectrical drawings: F753, F858, F865, F866, F932, F939, F942, F976, F983.

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. JJ Nash 5/15/83 Task Force Concurrence [signature] 5/19/83

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. JJ Nash 5/15/83 Task Force Concurrence [signature] 5/19/83

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5. Licensing Basis Satisfaction

A. Preliminary
This situation provides an inconvenience to CONST; however, the controls required to 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-43 precludes improper hanger installation as a result of these nomenclature discrepancies.

B. Final
This situation is only an inconvenience to CONST. TVA walkdown inspection, WBN 79-14, in place per ECN 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 nomenclature discrepancies exist. Inspection will be more stringent in the future as a result of B&V review.

Resp. Org. JJ Noah 5/15/83 Task Force Concurrence [signature] 5/19/83

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7A. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10A. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11A. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

The program implemented by OEDC regarding CEB 81-30 is adequate for completed work.

B. Final

The preliminary walkdown inspection, CEB 81-30, and final inspection, WBN 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.

Resp. Org. JJ Mark 5/5/83 Task Force Concurrence [signature] 5/9/83

7B. Identification of Corrective Action for Completed Work

A. Preliminary

The plan in 6B.A. appears adequate.

B. Final

The plan in 6B.B is adequate.

Resp. Org. JJ Nash 5/5/83 Task Force Concurrence [signature] 5/9/83

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

The preliminary walkdown inspection, CKB 81-30, completed under ECN 2576 for Unit 1, plus ECN 4080 to be completed by 12-30-83 were implemented to insure that supports are installed at the analyzed location. The final walkdown inspection, WBN-79-14, has been implemented and any corrective action required is underway. This corrective action is being tracked per the disposition of NCR WBNSWP 8248 and ECN 3100 and is scheduled to be completed by 1-30-84.

Resp. Org. JJ Nash 12/12/18 Task Force Concurrence [signature] 12/22/83

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. JJ Nash 5/5/83 Task Force Concurrence [signature] 6/7/83

1945

10B. Identification of Corrective Action for Future Work

A. Preliminary

The implementation of EN DES procedures must be assured so that design output documentation is correct.

B. Final

Design personnel should be made aware of the various existing design and drafting procedures to make sure they are adhered to in the future. Memo from J. C. Standifer to Those listed dated 3/1/83 (SWP 830302 015) is a cover memo for SWP AI-1 R2, which initiates a training program on a section basis for all EN DES KPs and all SWP KPs which affect the work of the section. The intent of this program is to ensure that all are familiar with the KPs which control WBP QA activities.

Resp. Org. JJ Mead 6/21/83 Task Force Concurrence [signature] 6/21/83

11B. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

See response to item 10B.B.

Resp. Org. JJ Mead 12/21/83 Task Force Concurrence [signature] 6/21/83

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R1
Date 4/6/83

1. Task Force Category 33 for Watts Bar Nuclear Plant - Unit 1

2. Task Force Category Description and Related B&V Findings:

Inadequate cable tagging: F807 and F809

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. Final

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. Hydraulic oil inadvertently spilled on the tag and caused the identifier legibility problem.

Resp. Org. Ed Burke 4/18/83 Task Force Concurrence [signature] 4/18/83

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 safety 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 CONST/NUC PR walkthrough inspection is conducted prior to transfer. These walkthroughs are designed to find and correct these type errors.

Resp. Org. Ed Burke 4/18/83 Task Force Concurrence [signature] 4/18/83

1947

5. Licensing Basis Satisfaction

A. Preliminary (See continuation)

B. Final

Construction agrees with the preliminary response. Accurate tagging is a means to improve control over construction inspection status and maintenance during plant operation. However, neither finding presents a safety problem and WBNP-WCI-1.22 has been designed to identify and correct these type errors. No further action required.

Resp. Org. Ed Brach 4/18/83 Task Force Concurrence [signature] 4/18/83

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7A. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10A. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11A. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

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 rework involving removal and reinstallation of the component. (This finding cannot be use-as-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. ~~00~~ R1
Date ~~3/4/83~~ 4/18/83

1. Task Force Category 34 for Watts Bar Nuclear Plant - Unit 1

2. Task Force Category Description and Related B&V 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. Final

Same as preliminary.

Resp. Org. A. Johnson 4/26/83 Task Force Concurrence W L Jones 4/26/83

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. Johnson 4/26/83 Task Force Concurrence W L Jones 4/26/83

5. Licensing Basis Satisfaction

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. No further evaluation is required.

B. Final

Same as preliminary.

Resp. Org. A. Johnson 4/26/83 Task Force Concurrence [signature] 4/26/83

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7A. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10A. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11A. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R1
Date 11/1/83

1. Task Force Category 35 for Watts Bar Nuclear 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

- 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.
- Inadequate checking of the drawing to ensure compliance with established criteria.

B. Final

See Continuation Sheet (page 7).

Resp. Org. [signature] 11/7/83 Task Force Concurrence [signature] 11/7/83

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. [signature] 11/7/83 Task Force Concurrence [signature] 11/7/83

5. Licensing Basis Satisfaction

A. Preliminary
(1) The licensing basis is not satisfied because TVA is committed to meeting the requirements of the National Electrical Code and has failed to fulfill this commitment for instantaneous trip settings for motors in MOVs rated less than 1/2 hp.
(2) The safety significance will have to be determined for each deviation identified.

B. Final
(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. [illegible] 11/9/83 Task Force Concurrence [signature] 11/7/83

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

No ongoing corrective action for completed work was being done at the time of the finding.

Resp. Org. [illegible] 11/4/83 Task Force Concurrence [signature] 11/7/83

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 (U1) and 3905 (U2) which were closed on September 8, 1983 (closure sheet 104 - WPB 830908 068). (See Continuation Sheet - page 7).

Resp. Org. [illegible] 11/4/83 Task Force Concurrence [signature] 11/7/83

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

ECNs 3904 (U1) and 3905 (U2) completed and closed on September 8, 1983 - closure sheet 104 (WBP 830908 068).

ECN 4251 - work in progress and will be tracked on ECN through completion.

Resp. Org. [illegible] 11/4/83 Task Force Concurrence [illegible] 11/7/83

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. N. Sprouse Ref: Memorandum from M. N. Sprouse to Those listed dated February 26, 1982 (MEB 820226 255).

Resp. Org. [illegible] 11/4/83 Task Force Concurrence [illegible] 11/7/83

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

None necessary due to ongoing corrective action specified in 9A.

Resp. Org. [illegible] 11/4/83 Task Force Concurrence [illegible] 11/7/83

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

Ongoing corrective action regarding EP training--References: Memorandum from M. W. Sprouse to Those listed dated February 26, 1982 (NRB 820226 255); Memorandum from J. C. Standifer to Those listed dated January 24, 1983 (NRB 830127 015).

Resp. Org. [illegible] 11/4/83 Task Force Concurrence [illegible] 11/7/83

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

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 EN DES Standard DS-E9.2.1. This standard specified (for the first time) that National 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 NEC 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 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 SHEET

Rev. RJ
Date 11/9/83

1. Task Force Category 36 for Watts Bar 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.
P135

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. Swallow 11/10/83 Task Force Concurrence 11/14/83

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

N/A

Resp. Org. R.L. Swallow 11/10/83 Task Force Concurrence 11/14/83

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. Sundblom 11/10/83 Task Force Concurrence [signature] 11/14/83

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. Sundblom 11/10/83 Task Force Concurrence [signature] 11/14/83

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

N/A

Resp. Org. R.L. Sundblom 11/10/83 Task Force Concurrence [signature] 11/14/83

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

N/A

Resp. Org. R.L. Swallow 11/10/83 Task Force Concurrence [signature] 11/14/83

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

N/A

Resp. Org. R.L. Swallow 11/10/83 Task Force Concurrence [signature] 11/14/83

10A. Identification of Corrective Action for Future Work

A. Preliminary
To be determined if in step 5 shows the licensing basis is not satisfied.

B. Final

N/A

Resp. Org. R.L. Swallow 11/10/83 Task Force Concurrence [signature] 11/14/83

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

N/A

Resp. Org. [redacted] 11/10/83 Task Force Concurrence [redacted] 11/14/83

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary
N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary
N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary
N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary
N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary
N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary
N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary
N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

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 WBN cables, vendors normally stay within ICEA tolerences 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 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 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

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 instrumentaion 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, 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. Moreover, 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 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
Review of Black &
Veatch Findings

EVALUATION SHEET

Rev. R1
Date 2/28/84

1. 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-auto 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 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 circuit design process.

Resp. Org. MR Belser 2/29/84 Task Force Concurrence [signature] 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 1.

B. Final

Concur.

Resp. Org. MR Belser 2/29/84 Task Force Concurrence [signature] 2/29/84

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. MRBelew 2/29/84 Task Force Concurrence [signature] 2/29/84

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. MRBelew 2/29/84 Task Force Concurrence [signature] 2/29/84

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. MRBelew 2/29/84 Task Force Concurrence [signature] 2/29/84

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 accomplished prior to unit 1 fuel load by ECN 4591.

Resp. Org. MR Below 2/29/84 Task Force Concurrence [signature] 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 Below 2/29/84 Task Force Concurrence [signature] 2/29/84

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. MR Below 2/29/84 Task Force Concurrence [signature] 2/29/84

11A. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

N/A

Resp. Org. MR Barker 2/29/84 Task Force Concurrence [illegible] 2/29/84

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

TVA Task Force for
Review of Black & Veatch Findings

EVALUATION SHEET

Rev. 82
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 RG 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. [signature] 12/21/83 Task Force Concurrence [signature] 1/3/84

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. [signature] 12/21/83 Task Force Concurrence [signature] 1/3/84

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 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 BLN thermal overload bypass circuit design philosophy differing from that used at BFN, SQN, and WBN.

B. Final

See continuation sheet for justification.

Resp. Org. [signature] 12/21/83 Task Force Concurrence [signature] 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. [signature] 12/21/83 Task Force Concurrence [signature] 1/3/84

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. [signature] 12/21/83 Task Force Concurrence [signature] 1/3/84

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

N/A

Resp. Org. [signature] 12/21/83 Task Force Concurrence [signature] 1/3/84

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. [signature] 12/21/83 Task Force Concurrence [signature] 1/3/84

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

N/A

Resp. Org. [signature] 12/21/83 Task Force Concurrence [signature] 1/3/84

11A. Implementation of Corrective Action for Future Work

A. Preliminary

No corrective action required.

B. Final

No corrective action required.

Resp. Org. [signature] 12/21/83 Task Force Concurrence [signature] 1/13/84

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

No corrective action required.

B. Final

Resp. Org. [signature] 12/21/83 Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. [signature] 12/21/83 Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. [signature] 12/21/83 Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. [signature] 12/21/83 Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. [signature] 12/21/83 Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. Don Sally 12/21/83 Task Force Concurrence / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. Don Sally 12/21/83 Task Force Concurrence / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. Don Sally 12/21/83 Task Force Concurrence / /

5. Licensing Basis Satisfaction

B. Final

(1) RG 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. RG 1.106 also describes three methods that are acceptable to the Nuclear 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 Nuclear 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 EN DES. See design change request WB-DCR-482 (DES 830701 009); M. E. Sprouse to H. S. Green, September 21, 1983 (WBP 830921 056); and H. J. Green to M. E. Sprouse, November 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 Nuclear 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.B(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.

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R2
Date 3/1/84

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. R.L. Swallow 11/10/83 Task Force Concurrence 11/14/83

4. Evaluation for Generic Examples

A. Preliminary

This finding indicates that other similar examples exist.

B. Final

N/A

Resp. Org. R.L. Swallow 11/10/83 Task Force Concurrence 11/14/83

5. Licensing Basis Satisfaction

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. Goldsmith 3-2-84 3/2/84

Resp. Org. R.L. Swallows 11/10/83 R&S 3-2-84 Task Force Concurrence 11/14/83

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. R.L. Swallows 11/10/83 Task Force Concurrence 11/19/83

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 11/10/83 Task Force Concurrence 11/4/83

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

N/A

Resp. Org. R.L. Swallow 11/10/93 Task Force Concurrence [signature] 11/14/83

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

B. Final

N/A

Resp. Org. R.L. Swallow 11/10/93 Task Force Concurrence [signature] 11/14/83

10A. Identification of Corrective Action for Future Work

A. Preliminary

B. Final

N/A

Resp. Org. R.L. Swallow 11/10/93 Task Force Concurrence [signature] 11/14/83

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

N/A

Resp. Org. [redacted] 11/10/83 Task Force Concurrence [redacted] 11/4/83

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

5. Licensing Basis Satisfaction

B. Final

The licensing basis is satified 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 Vimasco allows heat transfer just as good as air.

For short circuit ratings, TVA uses a minimum 2/0 AWG cable size for shielded power cable applications (6.9-kV service at WBN), which is conservative from an ampacity viewpoint. When routed in cable trays, these 2/0 AWG cables may be installed random lay (side-by-side with no space between cables). Shielded power cables larger than 2/0 AWG (4/0 AWG 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-E12.1.2 for 90° C maximum copper conductor temperature in a 40° C ambient. The ampacity values for these cables given in DS-E12.1.2 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 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. 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

5. Licensing Basis Satisfaction (continued)

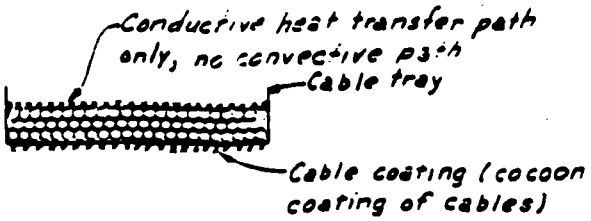
B. Final

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 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.

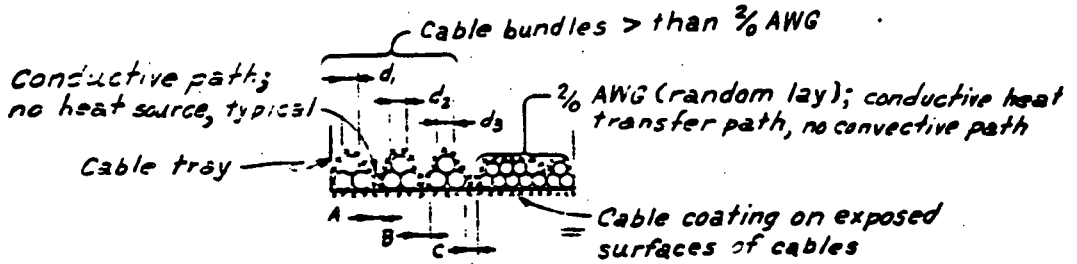
March 1, 1984 - Nonconformance WBNEEB 8401R2 (EEB 840214 918) identified a significant condition in which documentation was not available to show that Class 1E 6900-volt cable will not exceed its rated maximum continuous copper temperature of 90°C when installed in cable trays and covered with flame 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.



Mockup Arrangement For
Joslyn Research Center Ampacity
Test On Coated Cables

DETAIL A



$A = \frac{d_1}{2}$ 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

B & V (G901)
TF Cat. 39

TVA Task Force for
Review of Black &
Veatch Findings

EVALUATION SHEET

Rev. R2
Date 3/13/84

1. Task Force Category 1 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
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. [signature] 3/14/84 Task Force Concurrence [signature] 3/16/84

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. [signature] 3/14/84 Task Force Concurrence [signature] 3/16/84

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. [signature] 3/16/84 Task Force Concurrence [signature] 3/16/84

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary
NCR SWP 8267 written on unit 1 (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. 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. [signature] 3/16/84 Task Force Concurrence [signature] 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 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. [signature] 3/16/84 Task Force Concurrence [signature] 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 4667 issued.

Resp. Org. [signature] 3/6/84 Task Force Concurrence [signature] 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. [signature] 3/6/84 Task Force Concurrence [signature] 3/6/84

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. [signature] 3/6/84 Task Force Concurrence [signature] 3/6/84

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

Training in EN DES EP 4.25 completed on July 28, 1982, for I&C Section.

Resp. Org. [signature] 3/1/84 Task Force Concurrence [signature] 3/6/84

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. 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 _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

Corrective action should address all nonsafety systems and should correct drawings on a priority based upon system importance to nuclear safety and plant operability.

B. Final

NA

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Comple_ed Work

A. Preliminary

B. Final

NA

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

B. Final

NA

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

B. Final

N/A

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

N/A

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

N/A

Resp. Org. _____ / / Task Force Concurrence _____ / /

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 WBNP FSAR against the appropriate schematic diagrams to identify any additional functional mismatches. This review will be completed by March 30, 1984.

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R3
Date 3/9/84

1. Task Force Category 4 for Watts Bar Nuclear Plant - Unit 2

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. [signature] 3/16/84 Task Force Concurrence [signature] 3/17/84

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.

Resp. Org. [signature] 3/16/84 Task Force Concurrence [signature] 3/17/84

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. [signature] 3/16/84 Task Force Concurrence [signature] 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. [signature] 3/16/84 Task Force Concurrence [signature] 3/19/84

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. [signature] 3/16/84 Task Force Concurrence [signature] 3/19/84

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

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. DTClyff 1/10/84 Task Force Concurrence [signature] 1/10/84

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. DTClyff 5/21/83 Task Force Concurrence [signature] 5/15/83

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 9A 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. DTClyff 5/21/83 Task Force Concurrence [signature] 5/15/83

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. 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.

Resp. Org. [signature] 1/31/84 Task Force Concurrence [signature] 1/31/84

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

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 required 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.

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R2
Date 12/27/83

1. Task Force Category 5 for Watts Bar Nuclear Plant - Unit 2

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.

Resp. Org. M R Belser 1/9/84 Task Force Concurrence [signature] 1/9/84

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. M R Belser 1/9/84 Task Force Concurrence [signature] 1/9/84

5. Licensing Basis 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) N/A

Resp. Org. MR Belser 1/9/84 Task Force Concurrence [signature] 1/9/84

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. The NCR is not yet applicable to unit 2.

B. Final

N/A

Resp. Org. MR Belser 1/9/84 Task Force Concurrence [signature] 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 Belser 1/9/84 Task Force Concurrence [signature] 1/9/84

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

N/A

Resp. Org. M R Belser 1/4/84 Task Force Concurrence [signature] 1/9/84

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. M R Belser 1/9/84 Task Force Concurrence [signature] 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 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 S1 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 Belser 1/9/84 Task Force Concurrence [signature] 1/9/84

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

Corrections identified in 10A.B are in place.

Resp. Org. MR Belew 11/9/84 Task Force Concurrence [signature] 11/9/84

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

N/A

Resp. Org. MR Belew 11/9/84 Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

N/A

Resp. Org. M R Bulow 1/9/84 Task Force Concurrence ____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

N/A

Resp. Org. M R Bulow 1/9/84 Task Force Concurrence ____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

N/A

Resp. Org. M R Bulow 1/9/84 Task Force Concurrence ____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

N/A

Resp. Org. M R Bellew 1/9/84 Task Force Concurrence / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

N/A

Resp. Org. M R Bellew 1/9/84 Task Force Concurrence / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

N/A

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

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: (1a) ineffective handling of the interface region between two analyses and (1b) 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. [signature] 3/15/84 Task Force Concurrence [signature] 3/16/84

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 2. (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 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. [signature] 3/15/84 Task Force Concurrence [signature] 3/16/84

5. Licensing Basis 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 1 findings are satisfied will be made after the findings are evaluated. Items (1) and (2) would also apply to unit 2 licensing basis.

B. Final

(1a, 1b) The licensing basis for these findings is not satisfied. (2) The licensing basis is satisfied.

Resp. Org. [signature] 3/16/84 Task Force Concurrence [signature] 3/16/84

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 NRC letter D.M. Verrelli to H. G. Parris dated September 10, 1982 and unit 1 NCR's WBNCEB 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

(1a) 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. [signature] 3/16/84 Task Force Concurrence [signature] 3/16/84

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 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

(1a, 1b) The plan in 6A.B. appears adequate. (2) Not applicable. No corrective action is required for unit 2.

Resp. Org. [signature] 3/16/84 Task Force Concurrence [signature] 3/16/84

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

(1a) 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 WBN 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. TR Cunningham 3/15/84 Task Force Concurrence W Green 3/16/84

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 unit 1 NCR's WBNCEB 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 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. TR Cunningham 3/15/84 Task Force Concurrence W Green 3/16/84

10A. Identification of Corrective Action for Future Work

A. Preliminary

B. Final

The action identified in 9A.B appears to be adequate.

Resp. Org. TR Cunningham 3/15/84 Task Force Concurrence W Green 3/16/84

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

Refer to 9A.B.

Resp. Org. [signature] 3/15/84 Task Force Concurrence [signature] 3/16/84

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

3A. Evaluation for Cause

B. Final - continued

WBN unit 2: (1a, 1b) 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 SHEET

Rev. R2
Date 1/18/83

1. Task Force Category 7 for Watts Bar Nuclear Plant - Unit 2

2. Task Force Category Description and Related Watts Bar Nuclear Plant unit 1 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
Watts Bar 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. Final

Concur with A except clearance and out of tolerance problems are usually oversights.

Resp. Org. [signature] 4/8/83 Task Force Concurrence [signature] 5/18/83

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. Org. [signature] 4/8/83 Task Force Concurrence [signature] 5/18/83

5. Licensing Basis Satisfaction

A. Preliminary

Until the 79-14 program Phase I & Phase II has been completed, the potential exists for the licensing basis not being satisfied.

B. Final

Concur.

Resp. Org. Norman L. Brown 4/19/83 Task Force Concurrence W. L. Jones 5/18/83

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.

Resp. Org. Norman L. Brown 4/18/83 Task Force Concurrence W. L. Jones 5/18/83

7A. Identification of Corrective Action for Completed Work

A. Preliminary

The plan in 6A is adequate.

B. Final

Concur.

Resp. Org. Norman L. Brown 4/18/83 Task Force Concurrence W. L. Jones 5/18/83

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.

Resp. Org. Thomas R Brown 11/18/83 Task Force Concurrence W. Lyon 11/18/83

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. Thomas R Brown 4/18/83 Task Force Concurrence W. Lyon 5/18/83

10A. Identification of Corrective Action for Future Work

A. Preliminary

Same comment as 9AA above.

B. Final

Concur.

Resp. Org. Thomas R Brown 4/18/83 Task Force Concurrence W. Lyon 5/18/83

11A. Implementation of Corrective Action for Future Work

A. Preliminary

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).

B. Final

Concur.

Resp. Org. [signature] 11/10/83 Task Force Concurrence [signature] 11/10/83

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

Implementation of Phase II of the 79-14 program will verify the final design and acceptance of the hangers.

B. Final

Concur. Audits by other groups will strengthen this program also. No further action required on this Black & Veatch category. This item is closed.

Resp. Org. [signature] 11/8/83 Task Force Concurrence ____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. ____ / / Task Force Concurrence ____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

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.

AJ Resp. Org. WBP A. Jonsson 7/20/83 Task Force Concurrence [signature] 7/20/83

4. Evaluation for Generic Examples

A. Preliminary

This finding applies to all embedded plates.

B. Final

Same as Preliminary.

AJ Resp. Org. WBP A. Jonsson 7/20/83 Task Force Concurrence [signature] 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.

AJ Resp. Org. WBP A. Jansen 7/20/83 Task Force Concurrence 7/20/83

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.

AJ Resp. Org. WBP A. Jansen 7/20/83 Task Force Concurrence 7/20/83

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.

AJ Resp. Org. WBP A. Jansen 7/20/83 Task Force Concurrence 7/20/83

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.

AJ Resp. Org. WBP A. Johnson 7/20/83 Task Force Concurrence 7/20/83

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 A. Johnson 7/20/83 Task Force Concurrence 7/20/83

10A. Identification of Corrective Action for Future Work

A. Preliminary

Plan in 9A appears adequate.

B. Final

Plan in 9A is adequate.

AJ Resp. Org. WBP A. Johnson 7/20/83 Task Force Concurrence 7/20/83

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. 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. Org. A. Johnson 12/7/89 Task Force Concurrence [signature] 12/8/89

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

TVA Task Force for
Review of Black &
Veatch Findings

EVALUATION SHEET

Rev. 02
Date 12/27/83

1. Task Force Category 11 for Watts Bar Nuclear Plant - Unit 2

2. Task Force Category Description and Related Watts Bar Nuclear 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. 12/29/83 Task Force Concurrence 1/5/84

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 WBN unit 1 findings suggest that other deviations may exist. A sample of piping problems will be reviewed as discussed in EN 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. 12/29/83 Task Force Concurrence 1/5/84

5. Licensing Basis Satisfaction

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. Final

The licensing basis is not satisfied.

Resp. Org. PSW [signature] 12/29/83 Task Force Concurrence [signature] 1/5/84

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

NCR WBNCEB 8215 and EN DES SEP 82-15 address the findings. SEP 82-15 does not adequately address the generic implications referred to in 4.

B. Final

NCR WBNCEB 8215 and EN 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. PSW [signature] 12/29/83 Task Force Concurrence [signature] 1/5/84

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) reanalysis 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. PSW [signature] 12/29/83 Task Force Concurrence [signature] 1/5/84

8A. 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 SIS remains to be completed. This entire effort is being tracked through NCR WBNCEB8215.

Resp. Org. PSU 12/29/83 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 ongoing corrective action for future work.

B. Final

There is no ongoing corrective action for future work.

Resp. Org. PSU 12/29/83 Task Force Concurrence 1/5/84

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 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 WBN 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. PSU 12/29/83 Task Force Concurrence 1/5/84

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

Refer to 9A.B. Retrievable operational modes documents will be developed by 1/30/86. This effort is being tracked through NCR WBNCEB8215.

Resp. Org. [redacted] 12/9/85 Task Force Concurrence [redacted] 1/5/84

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

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 WEP 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 SHEET

Rev. R2
Date 11/9/83

1. Task Force Category 12 for Watts Bar Nuclear Plant - Unit 2

2. Task Force Category Description and Related Watts Bar Nuclear Plant unit 1 B&V Findings:

Failure by EN DES and CONST 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 EN DES and CONST 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. Pratt 5/17/83 Task Force Concurrence [signature] 6/1/83

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 CONST'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.

Resp. Org. R.D. Pratt 5/17/83 Task Force Concurrence [signature] 6/1/83

2743

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

~~Same as 5A.~~ Based on the deficiencies found on Unit 1, the licensing basis is not satisfied for Unit 2.

Resp. Org. R.D. Pratt 5/17/83 R.D. Pratt 11/14/83 Task Force Concurrence 6/1/83 11/14/83

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary - The corrective action for NCR's WBNSWP 8252 and 4164R is a 100% verification per EN DES SEP 82-18 of all Watts Bar unit 2 pipe supports that were alternately analyzed 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 WBN 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 SWP. These plans appear to be adequate.

B. Final

See attached sheet

Resp. Org. R.D. Pratt 5/17/83 Task Force Concurrence 6/1/83

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. Pratt 5/17/83 Task Force Concurrence 6/1/83

8A. 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 WBNSWP8252 R2. This NCR is an open 50.55(e) item for Unit 2 and will require tracking until it is complete.

Resp. Org. R. D. Pratt 11/9/83 Task Force Concurrence [signature] 11/9/83

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary - Corrective Action for NCR's WBN 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 EN DES and CONST personnel responsible for implementing the alternate analysis criteria. This appears to be adequate. Corrective action for NCR WBN CEB 8231 has not yet been identified.

B. Final

See attached sheet.

Resp. Org. R. D. Pratt 5/27/83 Task Force Concurrence [signature] 6/1/83

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 5/17/83 Task Force Concurrence [signature] 6/1/83

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

All corrective action is complete. SWP-EP 43.21 has been issued. Revisions have been made to the 47A053 drawing series. Rosters of personnel attending training have been maintained. In the future, CEB will not analyze piping by alternate analysis. Reanalysis of the current alternate analysis problems will be by rigorous analysis.

Resp. Org. R.D. Pratt 11/9/83 Task Force Concurrence [signature] 11/14/83

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

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 & Veatch Findings

EVALUATION SHEET

Rev. R1
Date 5/6/83

1. Task Force Category 13 for Watts Bar Nuclear Plant - Unit 2

2. Task Force Category Description and Related Watts Bar Nuclear Plant unit 1 B&V 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. Final

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.

Resp. Org. Ed Burke 4/18/83 Task Force Concurrence [signature] 4/20/83

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 Burke 4/18/83 Task Force Concurrence [signature] 4/20/83

5. Licensing Basis Satisfaction

A. Preliminary
Watts 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.
Watts 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.

Resp. Org. Ed Burke 4/18/83 Task Force Concurrence [signature] 4/22/83

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

Task force is not aware of any action.

B. Final

No further action required since no errors were found.

Resp. Org. Ed Burke 4/18/83 Task Force Concurrence [signature] 4/22/83

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 Burke 4/15/83 Task Force Concurrence [signature] 4/22/83

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

No action required.

Resp. Org. Ed Burke 4/18/83 Task Force Concurrence [signature] 4/21/83

9A. Identification and Evaluation of Ongoing Corrective Action for Future 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 Burke 4/18/83 Task Force Concurrence [signature] 4/21/83

10A. Identification of Corrective Action for Future Work

A. Preliminary

B. Final

No action required.

Resp. Org. Ed Burke 4/18/83 Task Force Concurrence [signature] 4/21/83

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

No action required.

Resp. Org. Ed Burke 4/15/87 Task Force Concurrence 4/20/87

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

No action required.

Resp. Org. Ed Burke RCM 3/19/87 4/15/87 Task Force Concurrence 4/20/87 3/19/87

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R1
Date 12/22/83

1. Task Force Category 14 for Watts Bar Nuclear Plant - Unit 2

2. Task Force Category Description and Related Watts Bar Nuclear 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: F369, F371, F756, F767, F783, F784, F788, F794, F845, F853, F855, F899, F911, F949, F950, F951, F955, F958, F963, F964, F965, and F821.

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 ECNs 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. Final

The above causes may be applicable to unit 2. Unit 2 hangers involved with ECN 2576 have not been completed and no determination for unit 2 can be made.

Resp. Org. JJ Neal 1/3/84 Task Force Concurrence [signature] 1/5/84

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. JJ Neal 1/3/84 Task Force Concurrence [signature] 1/5/84

5. Licensing Basis Satisfaction

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 ECN 2576 will be implemented correctly ensuring that the licensing basis is satisified.

Resp. Org. JJ Nash 1/31/84 Task Force Concurrence [signature] 1/15/84

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 WBP-EP 43.14 will ensure the ECN is incorporated correctly and no corrective action will be necessary.

Resp. Org. JJ Nash 1/31/84 Task Force Concurrence [signature] 1/15/84

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. JJ Nash 1/31/84 Task Force Concurrence [signature] 1/15/84

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

All work on unit 2 implemented under ECN 2576 will be tracked by the ECN process per TVA procedures.

Resp. Org. JJ Mark 1/3/84 Task Force Concurrence [signature] 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. JJ Mark 1/3/84 Task Force Concurrence [signature] 1/5/84

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 ECNs on WBP will be written for a single unit only, therefore, eliminating much of the problem that occurred with ECN 2576. To prevent recurrence the review of analysis isometrics and load tables per the scope of the ECN have been upgraded to formal calculation packages requiring appropriate documentation. This upgrading and documentation per the scope of the ECN are requirements that have been incorporated into WBP-EP 43.14.

Resp. Org. JJ Mark 1/3/84 Task Force Concurrence [signature] 1/5/84

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final
All future evaluations of analysis isometrics and load tables, revised per reanalysis, will be performed using standard evaluation sheets in accordance with WBP-EP 43.14 issued 8-22-83 (ESB 830822 202). This evaluation procedure will ensure that no support revisions are overlooked. Each evaluation package will be considered a formal calculation package and will be microfilmed as such.

Resp. Org. JJ Nash 1/13/84 Task Force Concurrence [signature] 1/15/84

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

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

2. Task Force Category Description and Related Watts Bar Nuclear Plant unit 1 B&V 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.

Resp. Org. R.D. Pratt 4/19/83 Task Force Concurrence [signature] 11/10/83

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.

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. 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. Pratt 10/26/83 Task Force Concurrence [signature] 11/1/83

5. Licensing Basis Satisfaction

A. Preliminary

Licensing basis impact cannot be determined until all examples of deviations are identified and evaluated.

B. Final

~~Same as 5.A.~~ 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.D.Pratt 4/15/83 R.D.Pratt 11/9/83 Task Force Concurrence 11/10/83

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 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 CONST requesting them to verify whether the note has been used. If the note was used, CONST 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. R.D.Pratt 5/3/83 Task Force Concurrence 11/10/83

7A. Identification of Corrective Action for Completed Work

A. Preliminary

Analyze 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.Pratt 11/4/83 Task Force Concurrence 11/10/83

8A. Implementation and Inspection of Corrective Action for Completed Work

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.D. Pratt 11/6/83 Task Force Concurrence 11/10/83

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" ∅ 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. Pratt 11/4/83 Task Force Concurrence 11/10/83

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.

Resp. Org. R.D. Pratt 5/3/83 Task Force Concurrence 11/10/83

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final - Drawing 47A050-IT, note 3 was revised as follows (revision 2): "Where a surface mounted base plate with anchor bolts 7/8" diameter or less overlaps an embedded plate, and that one or more of the anchors cannot be installed, the anchor bolts in the way of the embedded plate may be omitted if at least 2" of 5/16" fillet weld between the surface mounted base plate and the embedded plate is provided for each omitted anchor bolt. The weld must come to or cross at least one centerline of the omitted bolt and meet requirement of specification N3C-928 and G32. This note applies to WB, SSD, SPD and GROUTED Bolts only."

Resp. Org. R.D.Rutt 6/29/83 Task Force Concurrence 11/1/83

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. 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 Watts Bar Nuclear Plant - Unit 2

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. MRBelew 6/3/83 Task Force Concurrence [signature] 6/6/83

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. MRBelew 6/3/83 Task Force Concurrence [signature] 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. MR Belew 6/3/83 Task Force Concurrence [signature] 6/6/83

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 Belew 6/3/83 Task Force Concurrence [signature] 6/6/83

7A. Identification of Corrective Action for Completed Work

A. Preliminary

The EN 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. MR Belew 6/3/83 Task Force Concurrence [signature] 6/6/83

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

Our engineering procedures and our NUREG 0588 program are adequate to assure proper handling of systems important to safety.

Resp. Org. MR Baker 6/3/83 Task Force Concurrence [signature] 7/26/83

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

The Task Force is not aware of any action.

B. Final

Presently there is no identified program to ensure implementation of corrective action for future work. However, a nonconformance report GENQAB 8204 has been written on this problem. Our Nuclear Engineering Branch is to resolve this NCR.

2/22/84 RAB

Resp. Org. MR Baker 6/3/86 Task Force Concurrence [signature] 6/6/83

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. MR Baker 2/22/84 Task Force Concurrence [signature] 2/23/84

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

See item 10A.

Resp. Org. M A Bulow 2/22/84 Task Force Concurrence 2/23/84

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

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:

1. The completed, current and future activities related to IEB79-01B, NUREG-0558, and 10CFR50.49,

2. Any new system that may be added to a plant environmental zone or [illegible],

3. The procurement of any safety-related component by EN DES or NUC PR and,

4. 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:

Issue plan for review	February 10, 1984
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 dependant 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 verification of installation and maintenance activities for input to the data base and for closure of an NCR (if one is issued)

(B*) To cover review for impact on existing system components, etc., resulting from new system additions in an existing environmental zone

(C*) To cover qualification testing

(D*) To cover "refined" analysis for a specific component in an existing environmental zone

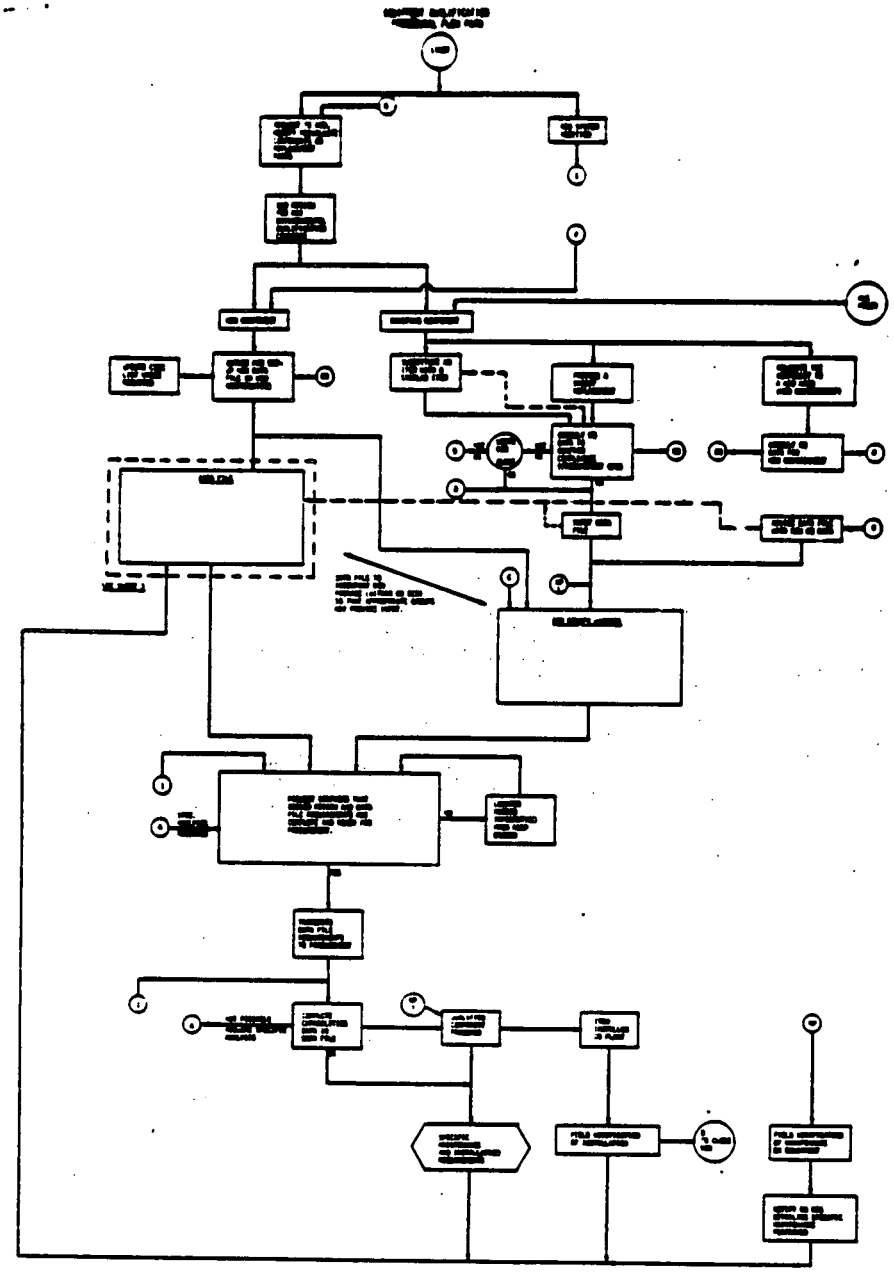
(E*) To cover the structure of the data base

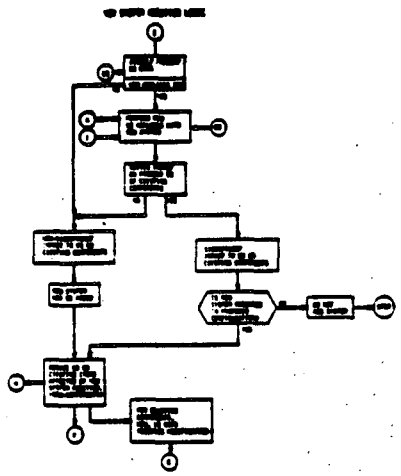
(F*) An upper tier procedure or document to define the overall program

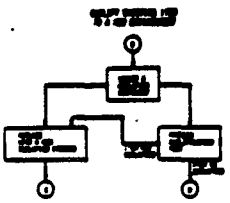
ATTACHMENT
EXISTING PROCEDURES

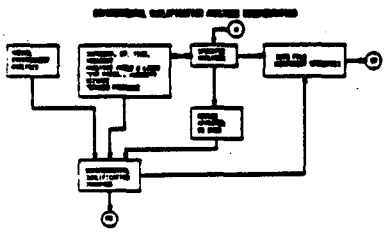
1. NCR's - Reporting and Handling (EP-1.26)
2. Control fo Documents Affecting Quality (EP-1.28)
3. TVA Memorandums Transmitting Quality Information - Handling in EN DES (EP-1.50)
4. Handling of Conditions Potentially Reportable Under Title 10 CFR Part 21, 50.36, and 50.55(e) (EP-2.02)
5. Design Criteria Documents (EP-3.01)
6. Seismic Design, Review and Control (EP-3.02)
7. Design Calculations (EP-3.03)
8. 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 EN DES Drawings (EP-4.01)
11. Engineering Change Notices (ECN's) before Licensing - Handling (EP-4.02)
12. Field change Requests Initiated by NUC PR (EP-4.06)
13. Design change Requests (DCR's) - Processing, Reviewing, and Approving (EP-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)
18. Release of QA Items from Suppliers' Shops to Construction Site (EP-5.43)

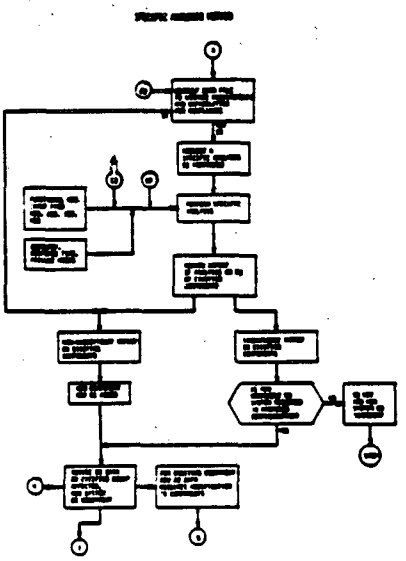
E14031.04

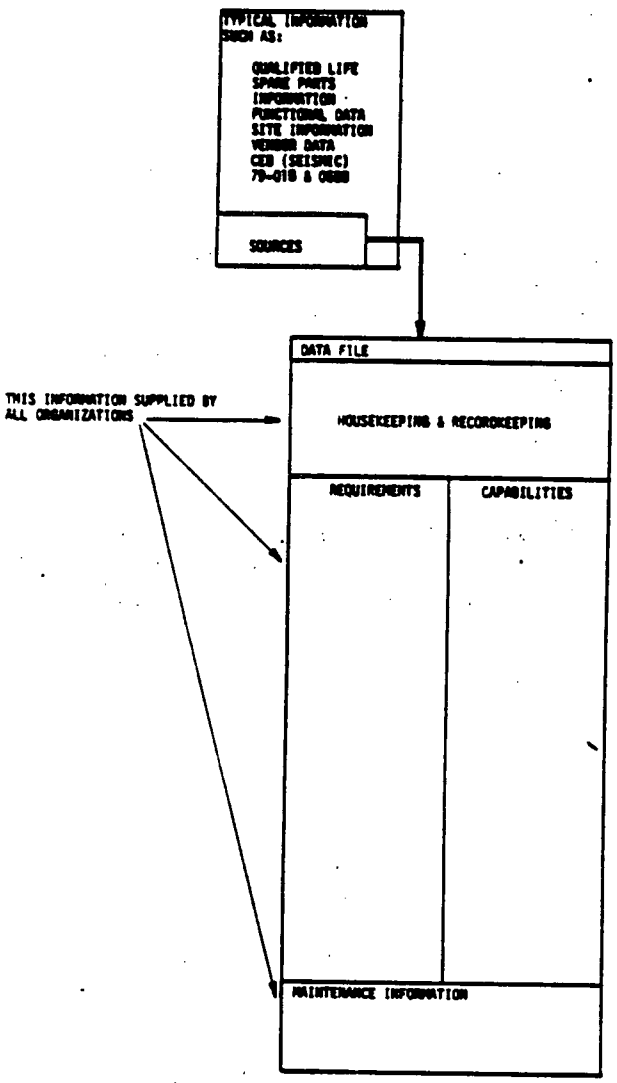











TYPICAL INFORMATION
SUCH AS:
QUALIFIED LIFE
SPARE PARTS
INFORMATION
FUNCTIONAL DATA
SITE INFORMATION
VENDOR DATA
CEB (SEISMIC)
79-01B & OOBB
SOURCES
DATA FILE
THIS INFORMATION SUPPLIED BY
ALL ORGANIZATIONS
HOUSEKEEPING & RECORDKEEPING
REQUIREMENTS
CAPABILITIES
MAINTENANCE INFORMATION

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R2
Date 11/9/83

1. Task Force Category 20 for Watts Bar Nuclear Plant - Unit 2

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. MR Belser 9/21/83 Task Force Concurrence [signature] 9/24/83

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 as

Resp. Org. MR Belser 9/21/83 Task Force Concurrence [signature] 9/24/83

5. Licensing Basis Satisfaction

A. Preliminary

Based on the cause in 3, the licensing basis for these time delay relays was not satisfied.

B. Final

Same as above

Resp. Org. MR Belser 9/2/83 Task Force Concurrence [signature] 9/26/83

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

The NCR WBNEEB 8301 has been written to identify the Black and Beatch 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 (EEB 830614 939) was written to document the relay settings.

Resp. Org. MR Belser 9/2/83 Task Force Concurrence [signature] 9/26/83

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. MR Belser 9/21/83 Task Force Concurrence [signature] 9/26/83

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. MR Belser 11/10/83 Task Force Concurrence [signature] 11/10/83

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. MR Belser 9/21/83 Task Force Concurrence [signature] 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 Belser 9/14/83 Task Force Concurrence [signature] 9/26/83

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

EN DES-SEP 83-11 (REB 831014 937) has been issued.

Resp. Org. MRBelmar 11/10/83 Task Force Concurrence [signature] 11/10/83

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

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 auxiliary feedwater turbine trip and throttle valve FCV-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 resolved through the squadchecking process. After resolution of all comments, the list was issued by memo. 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. OT Clay 9/7/83 Task Force Concurrence 9/7/83

4. Evaluation for Generic Examples

A. Preliminary

The identified cause does not lend itself to a simple 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.

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. OT Clay 9/7/83 Task Force Concurrence 9/7/83

5. Licensing Basis Satisfaction

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. DTClyt 9/7/83 Task Force Concurrence [signature] 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. DTClyt 9/7/83 Task Force Concurrence [signature] 9/7/83

7A. Identification of Corrective Action for Completed Work

A. Preliminary

NEB 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. DTClyt 9/7/83 Task Force Concurrence [signature] 9/7/83

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

WBN ECN-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. DTClift 9/7/83 Task Force Concurrence [signature] 9/7/83

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. DTClift 9/7/83 Task Force Concurrence [signature] 9/7/83

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. 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 EN DES by EP 2.10 and are identified on the TROI system for tracking purposes.

Resp. Org. DTClift 9/7/83 Task Force Concurrence [signature] 9/7/83

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

Implementing corrective action on future work will be handled by issued procedures within EM DES (such as NCRs, ECNs, etc.). Item 10 addresses how the list will be maintained current as the design progresses.

Resp. Org. DTClyt 9/7/83 Task Force Concurrence [signature] 9/7/83

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R2
Date 12/16/83

1. Task Force Category 25 for Watts Bar Nuclear Plant - Unit 2

2. Task Force Category Description and Related Watts Bar Nuclear Plant unit 1 B&V 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. TC Cannon 12/29/83 Task Force Concurrence 1/5/84

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. TC Cannon 12/29/83 Task Force Concurrence 1/5/84

5. Licensing Basis Satisfaction

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.B., there exists a slight potential that the licensing basis was not satisfied. (See Continuation Sheet, page 7)

Resp. Org. TC 12/29/83 Task Force Concurrence 1/5/84

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

The current planned corrective action for WBNCEB 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. TC 12/29/83 Task Force Concurrence 1/5/84

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. TC 12/29/83 Task Force Concurrence 1/5/84

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 NCR WBNCEB 8222.

(See Continuation Sheet, page 7)

Resp. Org. TC Carmin 12/29/83 Task Force Concurrence [signature] 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. TC Carmin 12/29/83 Task Force Concurrence [signature] 1/5/84

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. TC Carmin 12/29/83 Task Force Concurrence [signature] 1/5/84

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

A checklist which includes requirements for proper flange qualification and documentation has been incorporated into the WBN rigorous analysis handbook.

Resp. Org. [signature] 12/29/83 Task Force Concurrence [signature] 1/5/84

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

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 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.

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
Review of Black &
Veatch Findings

EVALUATION SHEET

Rev. R2
Date 3/19/84

1. Task Force Category 30 for Watts Bar Nuclear Plant - Unit 2

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.

Watts Bar unit 2: These causes appear to be applicable to Watts Bar unit 2.

B. Final

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 EN DES personnel.

Resp. Org. J. D. Collins 3/19/84 Task Force Concurrence [signature] 3/19/84

4. Evaluation for Generic Examples

A. Preliminary

1) 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. J. D. Collins 3/19/84 Task Force Concurrence [signature] 3/19/84

5. Licensing Basis Satisfaction

A. Preliminary

1) The licensing basis was not satisfied since the MD 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.

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.
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. G.D. Collins 3/19/84 Task Force Concurrence [signature] 3/19/84

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: EN DES response to finding F-100).

2) ECN 3636 referenced F-136. It also included generic examples specified in 4A.

Resp. Org. G.D. Collins 3/19/84 Task Force Concurrence [signature] 3/19/84

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.D. Collins 3/19/84 Task Force Concurrence [signature] 3/19/84

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

(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. J.D. Collins 3/19/84 Task Force Concurrence [signature] 3/19/84

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. N. Sprouse to Those listed dated February 26, 1982 (NEB 820226 255).

Resp. Org. J.D. Collins 3/19/84 Task Force Concurrence [signature] 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 (NEB 820226 255).

2) Engineering Procedures Training and Utilization Program initiated by M. N. Sprouse to Those listed dated February 26, 1982 (NEB 820226 255).

Resp. Org. J.D. Collins 3/19/84 Task Force Concurrence [signature] 3/19/84

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

(1) CTR R294 will track the completion of issuing a procedure to ensure that any equipment changed in the future is reviewed for compliance to status monitoring requirements of RG 1.47.

(2) The completion of training is an ongoing program that is required by M. N. Sprouse's memorandum to Those Listed dated February 26, 1982 (NEB 820226 255).

Resp. Org. G. D. Collins 3/19/84 Task Force Concurrence [signature] 3/19/84

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R1
Date 4/27/83

1. Task Force Category 31 for Watts Bar Nuclear Plant - Unit 2

2. Task Force Category Description and Related Watts Bar Nuclear Plant unit 1 B&V 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. Final

Both findings describe FSAR errors that are editorial in nature.

Resp. Org. DT Clift 4/27/83 Task Force Concurrence W Lyon 4/27/83

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. Final

No further evaluation is required.

Resp. Org. DT Clift 4/27/83 Task Force Concurrence W Lyon 4/27/83

5. Licensing Basis Satisfaction

A. Preliminary

The editorial nature of the FSAR errors does not jeopardize the licensing basis defined in the FSAR. Therefore, no further action required.

B. 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 type.

This assessment is applicable to both units at Watts Bar.

Resp. Org. NPTC&A 4/27/83 Task Force Concurrence 4/27/83

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7A. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10A. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11A. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

TVA Task Force for
Review of Black &
Veatch Findings

EVALUATION SHEET

Rev. R3
Date 12/19/83

1. Task Force Category 12 for Watts Bar Nuclear Plant - Unit 2

2. Task Force Category Description and Related Watts Bar Nuclear Plant unit 1 B&V Findings: Incompatible hanger drawings and piping isometric drawings: F753, F858, F865, F866, F932, F939, F942, F976, F983.

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 process.

Watts Bar unit 2:
- These causes appear to be applicable to Watts Bar unit 2.

B. Final
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.

Resp. Org. JJ Mack 5/5/83 Task Force Concurrence [signature] 5/9/83

4. Evaluation for Generic Examples

A. Preliminary

Problem is generic to hanger drawings and piping isometrics.

B. Final

Problem is generic to hanger drawings and piping isometrics that have been completed to date.

Resp. Org. JJ Mack 5/5/83 Task Force Concurrence [signature] 5/9/83

5. Licensing Basis Satisfaction

A. Preliminary
This situation provides an inconvenience to CONST; however, the controls required to 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-43 precludes improper hanger installation as a result of these nomenclature discrepancies.

B. Final
This situation is only an inconvenience to CONST. Final inspection, NBN 79-14, in place per ECN 3100 will identify visual discrepancies on completed work and drawings will be correctd. Hangers are installed per hanger detail drawings and inspected for proper location per analysis isometrics. This method prevents improper hanger installation even though nomenclature discrepancies exist. Inspection will be more stringent in future on this as a result of the Black and Veatch review.

Resp. Org. JJ Nash 5/5/83 Task Force Concurrence [illegible] 5/7/83

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7A. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10A. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11A. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

The program implemented by OEDC regarding CEB 81-30 is adequate for completed work.

B. Final

The preliminary walkdown inspection, CEB 81-30, and final inspection, WBN 79-14, implemented by OEDC are adequate for all completed work.

Resp. Org. JJ Mark 5/5/83 Task Force Concurrence [illegible] 5/7/83

7B. Identification of Corrective Action for Completed Work

A. Preliminary

The plan in 6B appears adequate.

B. Final

The plan in 6B.B is adequate.

Resp. Org. JJMark 5/5/83 Task Force Concurrence [signature] 5/9/83

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

The preliminary walkdown inspection, CEB 81-30 will be completed and tracked by ECN 2576. The final walkdown inspection WBN 79-14 will be implemented after CEB 81-30 and ECN 2576 are complete and will be tracked by NCR and ECN to be written when the program is implemented.

Resp. Org. JJMark 12/11/83 Task Force Concurrence [signature] 12/22/83

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. JJMark 5/5/83 Task Force Concurrence [signature] 6/7/83

10B. Identification of Corrective Action for Future Work

A. Preliminary

The implementation of KE DES procedures must be assured so that design output documentation is correct.

B. Final

Design personnel should be made aware of the various existing design and drafting procedures to make sure they are adhered to in the future. Memo from J. C. Standifer to Those listed dated 3/1/83 (SWP 830302 015) is a cover memo for SWP AI-1 R2, which initiates a training program on a section basis for all KE DES KPs and all SWP KPs which affect the work of the section. The intent of this program is to ensure that all are familiar with the KPs which control WRP QA activities.

Resp. Org. JJ Nash 6/21/83 Task Force Concurrence [illegible] 6/21/83

11B. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

See response to item 10B.B.

Resp. Org. JJ Nash 12/21/83 Task Force Concurrence [illegible] 6/21/83

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

TVA Task Force for
Review of Black &
Veatch Findings

EVALUATION SHEET

Rev. R1
Date 4/6/83

1. Task Force Category 33 for Watts Bar Nuclear Plant - Unit 2

2. Task Force Category Description and Related Watts Bar Nuclear Plant unit 1 B&V Findings:

Inadequate cable tagging: F807 and F809

3. Evaluation for Cause

A. Preliminary
Watts Bar 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 Bar unit 2: This cause does not appear to be applicable to Watts Bar unit 2.

B. Final

The nineteen cables which were involved in category 13 for unit 2 were checked for tagging. No errors were identified.

Resp. Org. Ed Burke 4/18/83 Task Force Concurrence [signature] 4/18/83

4. Evaluation for Generic Examples

A. Preliminary
Watts Bar unit 1:
This is not considered to be generic due to the low frequency and the findings do not present a safety problem.
Watts Bar unit 2:
This does not apply to Watts Bar unit 2.

B. Final

Not generic since no errors were identifed.

Resp. Org. Ed Burke 4/18/83 Task Force Concurrence [signature] 4/18/83

5. Licensing Basis Satisfaction

A. Preliminary

Due to the low frequency of the finding at Watts Bar unit 1 and the task force is not aware of any cases on Watts Bar unit 2 the licensing basis is satisfied.

B. Final

~~N/A~~ CONCUR RJM 4/18/83

Resp. Org. Ed Burch 4/18/83 Task Force Concurrence [signature] 4/18/83

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7A. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10A. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11A. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

TVA Task Force for
Review of Black &
Veatch Findings

EVALUATION SHEET

Rev. ~~20~~ R1
Date ~~3/14/83~~ 4/18/83

1. Task Force Category 34 for Watts Bar Nuclear Plant - Unit 2

2. Task Force Category Description and Related Watts Bar Nuclear Plant unit 1 B&V 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

Watts Bar 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.

Resp. Org. A. Jonakin 4/26/83 Task Force Concurrence [signature] 4/26/83

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 commitments.

B. Final

Same as preliminary.

Resp. Org. A. Jonakin 4/26/83 Task Force Concurrence [signature] 4/26/83

5. Licensing Basis Satisfaction

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. No further evaluation is required.

B. Final

Same as preliminary.

Resp. Org. A. Thomas 4/26/83 Task Force Concurrence [signature] 4/26/83

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7A. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10A. Identification of Corrective Action for Future Work

A. Preliminar

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11A. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R1
Date 11/1/83

1. Task Force Category 35 for Watts Bar Nuclear Plant - Unit 2

2. Task Force Category Description and Related Watts Bar Nuclear Plant Unit 1 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
Watts 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. - Inadequate checking of the drawing to ensure compliance with established criteria.
Watts Bar Unit 2 - This applies to Watts Bar Nuclear Plant unit 2.

B. Final

See Continuation Sheet (page 7).

Resp. Org. [signature] 11/9/83 Task Force Concurrence [signature] 11/7/83

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. [signature] 11/9/83 Task Force Concurrence [signature] 11/7/83

5. Licensing Basis Satisfaction

A. Preliminary
(1) The licensing basis is not satisfied because TVA is committed to meeting the requirements of the National Electrical Code and has failed to fulfill this commitment for instantaneous trip settings for motors in MOVs rated less than 1/2 hp.
(2) The safety significance will have to be determined for each deviation identified.

B. Final
(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. [illegible] 11/4/83 Task Force Concurrence [illegible] 11/7/83

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

No ongoing corrective action for completed work was being done at the time of the finding.

Resp. Org. [illegible] 11/4/83 Task Force Concurrence [illegible] 11/7/83

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 (U1) and 3905 (U2) which were closed on September 8, 1983 (closure sheet 104 - WPB 830908 068). (See Continuation Sheet - page 7).

Resp. Org. [illegible] 11/4/83 Task Force Concurrence [illegible] 11/7/83

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

ECNs 3904 (U1) and 3905 (U2) completed and closed on September 8, 1983 - closure sheet 104 (WBP 830908 068).

ECN 4251 - work in progress and will be tracked on ECN through completion.

Resp. Org. [illegible] 11/9/83 Task Force Concurrence [signature] 11/7/83

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. N. Sprouse Ref: Memorandum from M. N. Sprouse to Those listed dated February 26, 1982 (MKB 820226 255).

Resp. Org. [illegible] 11/9/83 Task Force Concurrence [signature] 11/7/83

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

None necessary due to ongoing corrective action specified in 9A.

Resp. Org. [illegible] 11/9/83 Task Force Concurrence [signature] 11/7/83

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

Ongoing corrective action regarding EP training--References: Memorandum from M. H. Sprouse to Those listed dated February 26, 1982 (NKB 820226 255); Memorandum from J. C. Standifer to Those listed dated January 24, 1983 (NKB 830127 015).

Resp. Org. [illegible] 1/9/83 Task Force Concurrence [illegible] 1/17/83

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

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, 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 EN DES Standard DS-E9.2.1. This standard specified (for the first time) that National 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 NEC criteria. The designer judged that the lowest setting for the existing breaker, while slightly higher than 13 tims 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 SHEET

Rev. R1
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 Nuclear Plant Unit 1 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. A.L. Sumlin 11/10/83 Task Force Concurrence [signature] 11/14/83

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

N/A

Resp. Org. A.L. Sumlin 11/10/83 Task Force Concurrence [signature] 11/14/83

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. Swallow 11/10/83 Task Force Concurrence 11/14/83

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. Swallow 11/10/83 Task Force Concurrence 11/14/83

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

N/A

Resp. Org. R.L. Swallow 11/10/83 Task Force Concurrence 11/14/83

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

N/A

Resp. Org. R.L. Swallows 11/10/83 Task Force Concurrence [signature] 11/14/83

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

N/A

Resp. Org. R.L. Swallows 11/10/83 Task Force Concurrence [signature] 11/14/83

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

N/A

Resp. Org. R.L. Swallows 11/10/83 Task Force Concurrence [signature] 11/14/83

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

N/A

Resp. Org. R.L. Swallow 11/10/93 Task Force Concurrence [signature] 11/14/83

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary
N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary
N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary
N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary
N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary
N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary
N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary
N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

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 WBN cables, vendors normally stay within ICEA tolerences 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 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 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

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 instrumentaion 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, 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. Moreover, 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 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
Review of Black &
Veatch Findings

EVALUATION SHEET

Rev. R1
Date 2/28/84

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 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-auto contact of the Westinghouse W-2 control switch on the unit control board: FI12

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 circuit design process.

Resp. Org. MR Belser 2/29/84 Task Force Concurrence [signature] 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. MR Belser 2/29/84 Task Force Concurrence [signature] 2/29/84

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 4592 will correct this condition.

Resp. Org. MR Baker 2/29/84 Task Force Concurrence [signature] 2/29/84

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. MR Baker 2/29/84 Task Force Concurrence [signature] 2/29/84

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. MR Baker 2/29/84 Task Force Concurrence [signature] 2/29/84

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. MR Behm 2/29/84 Task Force Concurrence [signature] 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 Behm 2/29/84 Task Force Concurrence [signature] 2/29/84

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. MR Behm 2/29/84 Task Force Concurrence [signature] 2/29/84

11A. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

N/A

Resp. Org. M R Belew 2/29/84 Task Force Concurrence [signature] 2/29/84

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

[signature] 2/29/84

Resp. Org. ~~M R Belew 2/29/84~~ Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

TVA Task Force for
Review of Black &
Veatch Findings

EVALUATION SHEET

Rev. 02
Date 12/19/83

1. Task Force Category 18 for Watts Bar Nuclear Plant - Unit 2

2. Task Force Category Description and Related Watts Bar Nuclear 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. [signature] 12/21/83 Task Force Concurrence [signature] 1/3/84

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. [signature] 12/21/83 Task Force Concurrence [signature] 1/3/84

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 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 BLN thermal overload bypass circuit design philosophy differing from that used at BFN, SQN, and WBN.

B. Final

See continuation sheet for justification.

Resp. Org. [signature] 12/21/83 Task Force Concurrence [signature] 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. [signature] 12/21/83 Task Force Concurrence [signature] 1/3/84

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, C.1.b, and IEEE 279, 4.10.
Resp. Org. [signature] 12/21/83 Task Force Concurrence [signature] 1/3/84

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

N/A

Resp. Org. [signature] 12/21/83 Task Force Concurrence [signature] 1/3/84

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. [signature] 12/21/83 Task Force Concurrence [signature] 1/3/84

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

N/A

Resp. Org. [signature] 12/21/83 Task Force Concurrence [signature] 1/3/84

11A. Implementation of Corrective Action for Future Work

A. Preliminary

No corrective action required.

B. Final

No corrective action required.

Resp. Org. [signature] 12/21/83 Task Force Concurrence [signature] 1/13/84

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

No corrective action required.

B. Final

Resp. Org. [signature] 12/21/83 Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. [signature] 12/21/83 Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. [signature] 12/21/83 Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. [signature] 12/21/83 Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for F··ture Work

A. Preliminary

N/A

B. Final

Resp. Org. [signature] 12/21/83 Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. [signature] 12/21/83 Task Force Concurrence ____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. [signature] 12/21/83 Task Force Concurrence ____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. [signature] 12/21/83 Task Force Concurrence ____ / /

5. Licensing Basis Satisfaction

B. Final

(1) RG 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. RG 1.106 also describes three methods that are acceptable to the Nuclear 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 Nuclear 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 EN 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, November 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 Nuclear 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.B(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.

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R2
Date 3/1/84

1. Task Force Category 39 for Watts Bar Nuclear Plant - Unit 2

2. Task Force Category Description and Related Watts Bar Nuclear 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. Swallows 11/10/83 Task Force Concurrence [signature] 11/14/83

4. Evaluation for Generic Examples

A. Preliminary

This finding indicates that other similar examples exist.

B. Final

N/A

Resp. Org. R.L. Swallows 11/10/83 Task Force Concurrence [signature] 11/14/83

5. Licensing Basis Satisfaction

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).

C.N. Seidenth 3-2-84 — 3/2/84

Resp. Org. R.L. Swallow 11/10/83 — Task Force Concurrence — 11/14/83

R+S 3-2-84

6A. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

Task force is not aware of any corrective action.

B. Final

N/A

Resp. Org. R.L. Swallow 11/10/83 — Task Force Concurrence — 11/14/83

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. Swallow 11/10/83 — Task Force Concurrence — 11/14/83

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

N/A

Resp. Org. R.L. Swallow 11/10/83 Task Force Concurrence [signature] 11/14/83

9A. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

B. Final

N/A

Resp. Org. R.L. Swallow 11/10/83 Task Force Concurrence [signature] 11/14/83

10A. Identification of Corrective Action for Future Work

A. Preliminary

B. Final

N/A

Resp. Org. R.L. Swallow 11/10/83 Task Force Concurrence [signature] 11/14/83

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

N/A

Resp. Org. R.L. Swallow 11/10/93 Task Force Concurrence 11/14/93

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

5. Licensing Basis Satisfaction

B. Final

The licensing basis is satified 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 Vimasco allows heat transfer just as good as air.

For short circuit ratings, TVA uses a minimum 2/0 AWG cable size for shielded power cable applications (6.9-kV service at WBN), which is conservative from an ampacity viewpoint. When routed in cable trays, these 2/0 AWG cables may be installed random lay (side-by-side with no space between cables). Shielded power cables larger than 2/0 AWG (4/0 AWG 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-E12.1.2 for 90° C maximum copper conductor temperature in a 40° C ambient. The ampacity values for these cables given in DS-E12.1.2 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 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. 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

5. Licensing Basis Satisfaction (continued)

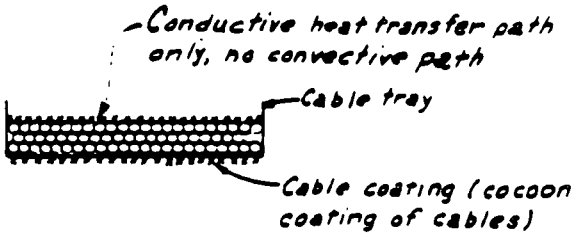
B. Final

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 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.

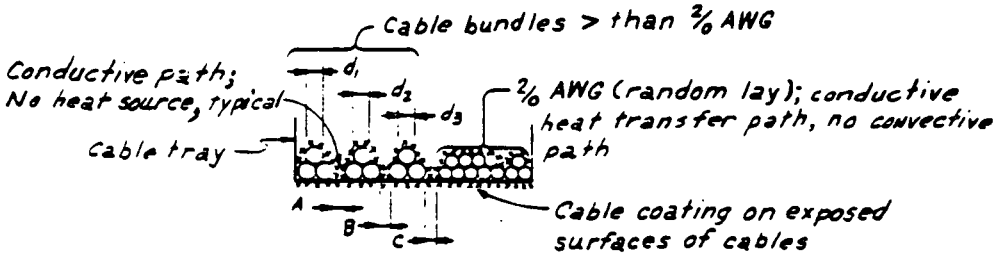
March 1, 1984 - Nonconformance WBNEEB 8401R2 (EEB 840214 918) identified a significant condition in which documentation was not available to show that Class 1E 6900-volt cable will not exceed its rated maximum continuous copper temperature of 90 C when installed in cable trays and covered with flame 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.



Mockup Arrangement For
Factory Mutual Research Ampacity
Test On Coated Cables

DETAIL A



$A = \frac{d_1}{2}$ 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 (8 KV) Power Cables
Installed At Watts Bar Nuclear Plant

DETAIL B

Figure 1
Typical Arrangement Of
Insulated Power Cables
Coated With Vimasco 2-B

B&V (G 901)
TF Cat. 39

APPENDIX D

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).

APPENDIX D

SAFETY EVALUATION FOR
CATEGORY II

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).

APPENDIX D

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 applicalbe 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).

APPENDIX D

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).

APPENDIX D

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 of a 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 WBN FSAR, Section 10.4.9.1).

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).

APPENDIX 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 1E 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 hign trip settings would not prevent the safe operation or the safe shutdown of the plant. This conclusion is based 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 1E 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).

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 brigntly 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.

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

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 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. [signature] 3/14/84 Task Force Concurrence [signature] 3/16/84

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. [signature] 3/14/84 Task Force Concurrence [signature] 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. [signature] 3/14/84 Task Force Concurrence [signature] 3/16/84

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. [signature] 3/14/84 Task Force Concurrence [signature] 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. [signature] 3/14/84 Task Force Concurrence [signature] 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.

Resp. Org. [signature] 3/14/84 Task Force Concurrence [signature] 3/16/84

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. [signature] 3/16/84 Task Force Concurrence [signature] 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. [signature] 3/14/84 Task Force Concurrence [signature] 3/16/84

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final
Training in EN DES EP 4.25 completed on July 28, 1982, for I&C Section.

Resp. Org. [signature] 3/1/84 Task Force Concurrence [signature] 3/6/84

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 December 10, 1984 (QMS 841210 205).

Resp. Org. [signature] 12-31-84 Task Force Concurrence [signature] 12/31/84

6B. 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 _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

Corrective action should address all nonsafety systems and should correct drawings on a priority based upon system importance to nuclear safety and plant operability.

B. Final

NA

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

NA

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

B. Final

NA

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

B. Final

NA

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

NA

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 _____ / /

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 WBNP FSAR against the appropriate schematic diagrams to identify any additional functional mismatches. This review will be completed by March 30, 1984.

TVA 84 (08-9-83)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

QMS '841210 205

841214T0025 (1)

TO : Quality Management Staff Files

FROM : J. W. von Weisenstein, 384 SPB-K

DATE : December 10, 1984

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

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)

12/10/84 - EGB:MBP
cc (Attachments):
R. W. Cantrell, W11A9 C-K
MEDS, W5B63 C-K

02700

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

0192

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 Units 1 and 2
CATEGORY: 3

Prepared By: Donald C. White
Date: 12/7/84

Approved By: [signature]
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:

1. 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 Management 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	45N1645-9 R13
			45W1724-1 R5
			0126D4529 R905
			0126D4543-3 R913

02640

Specific components were selected from logic diagram 47W611-72-1 R12 to verify compatibility. Component selection included four switches, XS 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 ECNs 4358 and 4360, as appropriate.

Diagram and Revision at Time of TVA Review	Diagram and Revision That Incorporated ECNs 4358 and/or 4360
47W611-72-1 R9	47W611-72-1 R10 (ECN 4358)
47W610-72-1 R10	No discrepancies identified
45W760-72-1 R6	45W760-72-1 R8 (ECN 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

2. 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

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incorporate ECNs 4666 and 4667. This was accomplished under R5 to 47W611-63-1.

3. 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 ECNs 4358, 4359, and 4360 to correct mismatches in the logic, control, schematic, and connection diagrams as a result of the review. TVA also issued ECNs 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 ECNs have been completed. The following identifies each ECN and respective closure sheets.

ECN	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 EP training rosters were observed to verify that EP training had been conducted for EP 4.25. The observation revealed that an EP training roster did exist for EP training on EPs 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 November 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

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 WBN. 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 EEB.

It is evident that the I&C section of WBEP has implemented adequate design change control requirements regarding changes prompted by ECN 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. ECN 4359 (WBP 831107 516)
4. ECN 4360 (WBP 831107 512)
5. ECN 4666 (WBP 840315 518)
6. ECN 4667 (WBP 840315 522)
7. ECN Closure Sheet 121 for ECN 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)
10. M. 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. M. Verrelli's NRC Inspection Report to H. G. Parris dated October 4, 1984 (NEB 841016 609)
13. E. Gray Beasley's memorandum to OEDC Manager's Office Files dated August 2, 1983 (EDC 830802 401)
14. SWP (I&C) Training Roster for EN 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. List of Personnel Contacted:

Name	Title	Organization
E. Gray Beasley	Staff Chief	QMS
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	NEB
L. T. McCord	Electrical Engineer	EEB (WBEP)
W. M. Roop, Jr.	Supervisor	EEB
M. J. Sarlitto	Mechanical Engineer	EEB (WBEP)
S. R. Stout	Nuclear Engineer	NEB
E. R. Whitley	Electrical Engineer	EEB (WBEP)

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
CATEGORY: 3

Prepared By: L. E. Brock
Date: 10/19/88

Approved By: [signature]
Date: 10.13.88

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 effectiveness of the EP training based upon the evaluation of the adequacy of some work output (work which was initiated after July 28, 1982).

02440

WATTS BAR NUCLEAR PLANT
B&V PROJECT 10520

ECN NO. 3683
ATTACHMENT 1
SHEET 1 OF 1

FINDINGS REPORT

FINDING NUMBER	FINAL CLASSIFICATION
F129	TYPE ☐ CATEGORY ☐ (FILLED IN BY SENIOR REVIEW TEAM CHAIRMAN)

DESCRIPTION: REF. TVA DWGS 45W600-66-6, REV. 4 AND 45N600-57-5, REV. 2

THE LIMIT SWITCH THAT ACTUATES RELAY BB WHICH, IN TURN, INTERLOCKS WITH TIME DELAY RELAY TD1 IS SHOWN TO OPERATE WHEN THE "TRIP AND THROTTLE VALVE" (FCV-1-51) IS FULLY OPEN. THIS DOES NOT AGREE WITH LOGIC DIAGRAMS 46W611-3-3, REV. 2 AND 46W611-3-4, REV. 2 WHICH INDICATE THAT THE LIMIT SWITCH ACTUATES WHEN FCV-1-51 IS HALF OPEN.

INITIATED BY Randy J. Kriesel DATE Oct. 29, 1982

LEAD REVIEWER'S ACTION

REMARKS: Discrepancy was verified.

SIGNATURE R.J. Cunningham DATE Oct. 29, 1982

RECOMMENDED CLASSIFICATION
TYPE 0
CATEGORY A

PROJECT MANAGER'S ACTION

REMARKS:

SIGNATURE _____ DATE _____

RECOMMENDED CLASSIFICATION
TYPE _____
CATEGORY _____

SENIOR REVIEW TEAM ACTION (COMPLETE FINAL CLASSIFICATION IN BOX ABOVE)

REMARKS:

SIGNATURE _____ DATE _____
(CHAIRMAN)

SHEET 1
CONT'D ON SHEET ___

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3683
DATA SHEET NO. 2

BRANCH SWP

PAGE 1

To: Watts Bar Nuclear Plant, Spring City, TN

From: Design Project Manager SWP 204 C-K

Released By: G. D. Collins for Design Project Manager

Date: FEB 14 1983

Preparing Section	E-2
Prepared By:	R.E COMEAU
Total Pages (RO):	2
Section Supervisor:	
Staff Eng. or Architect:	N/A
Group Head:	G. D. Collins
Branch Chief:	Date

	MEDS Accession No.		MEDS Accession No.
RO	SWP 830214 566	R4	
R1		R5	
R2		R6	
R3		R7	

SCOPE

Project: WATTS BAR NUCLEAR PLANT — Affected Units: 1 & 2

System or Feature: FEEDWATER CONTROL SYSTEM (46)

Reference & Description of Change: REVISE LIMIT SWITCH OPERATION SUCH THAT THE CONTROL CIRCUITRY FOR THE "TRIP AND THROTTLE" VALVE (FCV1-51) OPERATES WHEN THE "TRIP AND THROTTLE" VALVE IS HALF OPEN: BLACK EVEREST FINDING E 129

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES

Perm. No. N/A

Materials as follows: NO PR'S

Additional Information: NONE

CHIEF, CHIEF PLANNING AND CONTROL STAFF, WSCC3 C-K
CHIEF, ARCHITECTURAL SUPPORT BRANCH, WSCC30 C-K
CHIEF, CIVIL ENGINEERING BRANCH, WSCC20 C-K
CHIEF, ELECTRICAL ENGINEERING BRANCH, WSCC50 C-K

PLANT SUPERINTENDENT
CONSTRUCTION PROJECT MANAGER
NUCLEAR, WSCC1 C-K
ADMIN. ASST. C-K

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3683
DATA SHEET NO. 2

PAGE 2

AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	CHECK IF ENTRY ON DATA SHT. REV. NO.
1&2	45N600-57-5	4	5-2-83	3-1-83		

SCOPE OF CHANGE ESTIMATE

WATTS BAR NUCLEAR PLANT DCN NO. 3683

BUILDING TURBINE BUILDING

SYSTEM/FEATURE: FEEDWATER CONTROL SYSTEM (46)

☒ Revisions by this section will not require additional material

☐ Revisions by this section will require additional materials as listed below

Item	Unit 1 Qty	Unit 2 Qty	Procured By (EN DES/CONST)	PR, Reqn, or Contr	Requested Delivery Date	Remarks

Preparer

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3683
DATA SHEET NO. 2

BRANCH SWP

PAGE 1

To: Watts Bar Nuclear Plant, Spring City, TN

From: Design Project Manager SWP 204 C-K

Released By: G. D. Collis for Design Project Manager

Date: FEB 14 1983

Preparing Section	E-2
Prepared By:	R.E COMEAU
Total Pages (RO):	2
Section Supervisor:	
Staff Eng. or Architect:	N/A
Group Head:	G. D. Collis
Branch Chief:	Date

MEDS Accession No.		MEDS Accession No.	
RO	SWP 830214566	R4	
R1		R5	
R2		R6	
R3		R7	

SCOPE

Project: WATTS BAR NUCLEAR PLANT — Affected Units: 1 & 2

System or Feature: FEEDWATER CONTROL SYSTEM (46)

Reference & Description of Change: REVISE LIMIT SWITCH OPERATION SUCH THAT THE CONTROL CIRCUITRY FOR THE "TRIP AND THROTTLE" VALVE (FCV1-51) OPERATES WHEN THE "TRIP AND THROTTLE" VALVE IS HALF OPEN: BLACK & VEATCH FINDING E 129

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES

Purch. No. N/A

Materials as follows: NO PR'S

Additional Information: NONE

CHIEF, COST PLANNING AND CONTROL STAFF, W12C70 C-K
CHIEF, ARCHITECTURAL SUPPORT BRANCH, W9C130 C-K
CHIEF, CIVIL ENGINEERING BRANCH, W9C220 C-K
CHIEF, ELECTRICAL ENGINEERING BRANCH, W9C130 C-K

PLANT SUPERINTENDENT
CONSTRUCTION PROJECT MANAGER
NUCLEAR, W10A1 C-K
ZIMMER, 640 C372-C

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3693
DATA SHEET NO. 2

PAGE 2

AFFECTED UNIT	DRAWING OR S/M NUMBER	ONS REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATE ON DATA SHT REV. NO.
1&2	45N600-57-5	4	5-2-83	3-1-83		

SCOPE OF CHANGE ESTIMATE

[redacted] NUCLEAR PLANT ECN NO. 3683

BUILDING TURBINE BLDG

SYSTEM/FEATURE: FEEDWATER CONTROL SYS (46)

☒ Revisions by this section will not require additional material

☐ Revisions by this section will require additional materials as listed below

Item	Unit 1 Qty	Unit 2 Qty	Procured By (EN DES/CONST)	PR, Reqn, or Contr	Requested Delivery Date	Remarks

R E Conneau
Preparer

Section Supervisor

ENGINEERING CHANGE NOTICE

COVER SHEET SWP '83 0214 569

(BEFORE ISSUANCE OF OPERATING LICENSE)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN Watts Bar Nuclear Plant, Spring City, TN

ECN NO. 3647

To: Construction Project Manager SWP 204 GB-R

~~8309280434~~ (10)

From: Design Project Manager

DATE FEB 14 1983

Budget item: 211

Was IJ Analysis Required: Yes ____ No ✓

Ross T. Graham — Prepared by
Electrical #1 — Section
[signature] — Section Leader

G. D. Collins — Project Engineer
Released: J C Standifer — Design Project Manager
2/11/83 — Date

SCOPE

Project: Watts Bar Nuclear Plant   Affected Unit(s): 1 & 2

System or Feature: Auxiliary Feedwater System (3) NCR WBN SWP 8267

Reference & Description of Change: Revise control and logic drawings and the FSAR to incorporate Black & Veatch findings F101, F102, F103, F104, F107, F120, F106. No XFR pkgs affected. (NCR WBN SWP 8267)

CLOSED

Closure SN 103 ... 8-26-83

DRAWINGS OR ... INVOLVED: (Attachments Required)	Yes or No	Date Branch Data Sheet Available
ENGINEERING SUPPORT BRANCHES		
Civil	NO	
Electrical EESB #3	~~YES~~ NO	
Mechanical	NO	
Nuclear	NO	
NUCLEAR PROJECTS DESIGN GROUPS		
Civil	NO	
Electrical E1	YES	
Mech	NO	
FOSSIL, HYDRO & SPECIAL PROJECTS DESIGN		
SPECIAL DESIGN PROJECTS	NO	
ARCHITECTURAL SUPPORT BRANCH	NO	

ENGINEERING SUPPORT BRANCHES Approval Required: YES

ECN is ready for branch review: [signature] Design Project Manager — 1-24-83 Date

Approved:
NA — ESB CIVIL BR. CHIEF — Date
F. W. Chandler — ESB ELECTRICAL BR. CHIEF — 2-7-83 Date
J. R. Lick for CAC — ESB MECHANICAL BR. CHIEF — 2-2-83 Date
K. Wilder for — Chief Nuclear Engineer — 2-11-83 Date

	Yes or No
Required for PSAR or FSAR	YES
Required for Preoperational Test:	~~NO~~ YES
If Yes, Test No.	TVA 22
Vendor Backcharges Involved	NO
Seismic Analysis Required	NO
Nonconformance Report Required	~~NO~~ YES
QA Applies	YES
Security System Modified	NO
Vendor(s) involved:	NONE

PHYSICAL WORK MUST BE DONE BEFORE:	Pre-Op Test	1st Fuel Load	1% Therm Power	Comm'l Oper'n	1st Refuel	
Unit(s) 1 & 2		✓				
Unit(s)						

WBP 830826 516 ~~WBP 830624 520~~

CC (Attachments): ~~Yes~~ NO

CHIEF, ARCHITECTURAL SUPPORT BRANCH
CHIEF, CIVIL ENGINEERING BRANCH
CHIEF, ELECTRICAL ENGINEERING BRANCH
CHIEF, MECHANICAL ENGINEERING BRANCH
CHIEF, NUCLEAR ENGINEERING BRANCH
CHIEF, QUALITY ASSURANCE BRANCH

CHIEF, COST PLANNING AND CONTROL STAFF
CHIEF, SPECIAL DESIGN PROJECTS
MANAGER OF CONSTRUCTION
PLANT SUPERINTENDENT

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3647
DATA SHEET NO. 1

BRANCH SWP
PAGE 1

To: Watts Bar Nuclear Plant, Spring City, TN

From: Design Project Manager SWP 204 C-K
" FEB 14 1983

Released By: G. D. Collins for Design Project Manager

Preparing Section: ELECTRICAL #1	
Prepared By: ROSS T. GRAHAM	
Total Pages (RO): 2	
Section Supervisor: J. D. Morris	
Staff Eng. or Architect: N/A	
Group Head: G. D. Collins	
Branch Chief: DATE	

	WBDR Accession No.		WBDR Accession No.
R1	SWP 830214 570	R4	
R2	SWP 830412 523	R5	
R3		R6	
		R7	

SCOPE

Project: WATTS BAR NUCLEAR PLANT — Affected Units: 1 & 2

System or Feature: AUXILIARY FEEDWATER SYSTEM (3)

Reference & Description of Change: REVISE CONTROL AND LOGIC DRAWINGS TO INCORPORATE BLACK & VEATCH FINDINGS F101, F102, F103, F104, F107, F130, F106. (NCR WBN SWP 8267)

CLOSED
DATE AUG 08 1983

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PREPARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
1	4-12-83	RTG	[illegible]	GL	N/A	YK	JCS	ADDED 1 DWG.	2

R. No. N/A

F. Materials as follows:

Additional Information: SEE Attach. 1 to Data Sh.

CHIEF, COST PLANNING AND CONTROL STAFF, W12C70 C-K
CHIEF, ARCHITECTURAL SUPPORT BRANCH, W9C120 C-K
CHIEF, CIVIL ENGINEERING BRANCH, W9C220 C-K
CHIEF, ELECTRICAL ENGINEERING BRANCH, W9C320 C-K
CHIEF, SPECIAL DESIGN PROJECTS, W9C220 C-K

PLANT SUPERINTENDENT
CONSTRUCTION PROJECT MANAGER
NSRB, W9B2 C-K
ARMS, 640 C572-K

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3642
DATA SHEET NO. 1

PAGE 2

AFFECTED UNIT	DRAWING OR B/M NUMBER	CHG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE QUOTED ON DATA SHEET REV. NO
1 & 2	47W610-3-3	18	4-11-83 ~~3-1-83~~	4-13-83		
	47W611-3-4	3		↓		
	47W605-8	11		2-24-83		
	47W600-57	4				
↓	47W600-60	4	↓	↓		
1 & 2	47W611-3-3	3	↓	4-13-83		1

Attach. 1 to Data Sh. 1

WATTS BAR NUCLEAR PLANT

ECN NO. 3647

BUILDING CONTROL AUXILIARY

SYSTEM/FEATURE: AUXILIARY FEEDWATER SYSTEM

☑ Revisions by this section will not require additional material

☐ Revisions by this section will require additional materials as listed below

Item	Unit 1 Qty	Unit 2 Qty	Procured By (EN DES/CONST)	PR, Reqn, or Contr	Requested Delivery Date	Remarks

Preparer

Section Supervisor

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3647

DATA SHEET NO. 2

Watts Bar Nuclear Plant

BRANCH EESB

PAGE 1

To:

From: Design Project Manager SWP 204 GBK

Released By: G. O. Collins for Design Project Manager

FEB 14 1983

Preparing Section: EESB I&C #3	MEDS Accession No.		MEDS Accession No.
Prepared By: W. T. ESTES	R0 SWP '83 0214 571	R4	
Total Pages (RO): 2	R1	R5	
Section Supervisor: T. B. Robinson	R2	R6	
Staff Eng. or Architect: M R Belew	R3	R7	
Group Head: G. T. Pagano 1/16			
Branch Chief: [signature] 1/16/83			

SCOPE

Project: WATTS BAR NUCLEAR PLANT — Affected Units: 1 & 2

System or Feature: AUXILIARY FEEDWATER SYSTEM

Reference & Description of Change: REVISE FSAR TO INCORPORATE BLACK & VEATCH FINDING F101 ITEM 3. "TABLE 7.5-1 OF THE FSAR SHOULD LIST THE AUXILIARY FEEDWATER FLOW. REFER TO Q30.12 and Q31.84." (NCR WBN SWP 8267)

CLOSED

DATE AUG 26 1983

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PREPARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES

Re No.

Fi Asterisk as follows:

Additional Information:

CHIEF, COST PLANNING AND CONTROL STAFF, W12C78 C-K
CHIEF, ARCHITECTURAL SUPPORT BRANCH, W4C126 C-K
CHIEF, CIVIL ENGINEERING BRANCH, W9B226 C-K
CHIEF, ELECTRICAL ENGINEERING BRANCH, W2C126 C-K
CHIEF, SPECIAL DESIGN PROJECTS, W9B226 C-K

PLANT SUPERINTENDENT
CONSTRUCTION PROJECT MANAGER
HEDS, W10H1 C-K
ADMS, E40 C572-K

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3647
DATA SHEET NO. 2

A 2

AFFECTED UNIT	DRAWING OR S/M NUMBER	CHNG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1 & 2	FSAR TABLE 7.5-1	—	3/30/83	NEB	8304213	

WATTS BAR NUCLEAR PLANT

ECN NO. 3647

BUILDING VARIOUS

SYSTEM/FEATURE: MAIN & AUX. FW SYSTEM #3

☒ Revisions by this section will not require additional material

☐ Revisions by this section will require additional materials as listed below

Item	Unit 1 Qty	Unit 2 Qty	Procured By (EN DES/CONST)	PR, Reqn, or Contr	Requested Delivery Date	Remarks

W. T. ESTES
Preparer

Section Supervisor

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3647
DATA SHEET NO. 3

BRANCH SWP

PAGE 1

To: Watts Bar Nuclear Plant, Spring City, TN

From: NPD Project Manager SWP 204 GBK

Released By: G. O. Collins for NPD Project Manager

Date: MAR 14 1983

Preparing Section	Elec B3
Prepared By:	Sherry Cutts 2-28-83 Date
Total Pages (ROI):	2
Section Supervisor:	J. F. Laney 3/1/83
Staff Eng. or Architect:	N/A
Group Head:	G. O. Collins
Br. Chief/ SOP Mgr.:	

	MEB Accession No.		MEB Accession No.
CS	SWP 830314 542	R4	
R1		R5	
R2		R6	
R3		R7	

SCOPE

Project: Watts Bar Nuclear Plant — Affected Units: 1&2

System or Feature: Auxiliary Feedwater System

References & Description of Change: Revise control & logic drawings to incorporate Black & Veatch Findings F101, F102, F103, F104, F107, F130, F106

CLOSED
DATE AUG 20 1983

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES

Recommendations: None

Field Materials as follows: None

Additional Information: Category A E3: 40 man-hours

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3647
DATA SHEET NO. 3

PAGE 2

AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE USED ON DATA REV.	TV
1	45N1692-1	11	4-15-83	3-7-83			
2	45N2692-1	8	↓	3-7-83			

SCOPE OF CHANGE ESTIMATE

WATTS BAR NUCLEAR PLANT ECN NO. 2647

BUILDING Auxiliary

SYSTEM/FEATURE: AUXILIARY FEEDWATER SYSTEM

☒ Revisions by this section will not require additional material

☐ Revisions by this section will require additional materials as listed below

Item	Unit 1 Qty	Unit 2 Qty	Procured By (EN DES/CONST)	PR, Reqn, or Contr	Requested Delivery Date	Remarks

Preparer

Section Supervisor

ENGINEERING CHANGE NOTICE

COVER SHEET

SWP '83 0120 524

(BEFORE ISSUANCE OF OPERATING LICENSE)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ECN NO. 3650

To: Construction Project Manager — Watts Bar Nuclear Plant, Spring City, TN

SWP 204 GB-K — 830920C0491 (5)

From: Design Project Manager

DATE JAN 20 1983

Budget item: 221

Was IJ Analysis Required: Yes ____ No ✓

CHARLES C. FISHER — Prepared by | SWP E2 — Section | [signature] — Section Leader

[signature] — Project Engineer | Released: [signature] — Design Project Manager | 1-17-83 — Date

SCOPE

Project WATTS BAR NUCLEAR PLANT — Affected Unit(s) 1 & 2

System or Feature (3) AUXILIARY FEEDWATER SYSTEM — NCR WBN SWP 8267

Reference & Description of Change CORRECT DRAWINGS PER BLACK & VEATCH FINDINGS [illegible]; F803; [illegible]; F806; [illegible]; F111; F115; [illegible]; F117; F127; F133; F141. TRANSFER PKGS X(3)-1 & X(3)-2 (NCR WBNSWP 8267)

CLOSED

8-26-83
MIC closure sh 103

DRAWINGS OR B/M'S INVOLVED (Data Sheets Required)	Yes/No	Date Branch Data Sheet Available
ENGINEERING SUPPORT BRANCHES		
Civil	NO	
Electrical	NO	
Mechanical	NO	
Nuclear	NO	
NUCLEAR PROJECTS DESIGN GROUPS		
Civil	NO	
Electrical E2	YES	
Mech	NO	
FOSSIL, HYDRO & SPECIAL PROJECTS DESIGN		
SPECIAL DESIGN PROJECTS	NO	
ARCHITECTURAL SUPPORT BRANCH	NO	

ENGINEERING SUPPORT BRANCHES Approval Required	Yes or No
	YES
ECN is ready for branch review: [signature] Design Project Manager	12-14-82 Date
Approved: N/A — EDS CIVIL EN. CHIEF	Date
[signature] for — EDS ELECTRICAL EN. CHIEF	12/28/82 Date
N/A — EDS MECHANICAL EN. CHIEF	Date
[signature] for — Chief Nuclear Engineer	1-7-83 Date

WBP '830826 539

	Yes or No
Required for PSAR or FSAR	NO
Required for Preoperational Test: If Yes, Test No.	NO
Vendor Backcharges Involved	NO
Seismic Analysis Required	NO
Nonconformance Report Required	~~NO~~ YES
QA Applies	~~NO~~ YES
Security System Modified	NO
Vendor(s) involved:	NONE

PHYSICAL WORK MUST BE DONE BEFORE:

	Pre-Op Test	1st Fuel Load	1% Therm Power	Comm'l Oper'n	1st Refuel	
Unit(s) 1 & 2		✓				
Unit(s)						

CC (Attachments): [illegible] YES (1)

[illegible]

9307280114 (8)

ENGINEERING CHANGE NOTICE
COVER SHEET SWP 83 0214 564

(BEFORE ISSUANCE OF OPERATING LICENSE)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ECN NO. 3683

To: Construction Project Manager Watts Bar Nuclear Plant, Spring City, TN

From: Design Project Manager SWP 204 C-K

DATE FEB 14 1983 Budget Item 221

Was LI Analysis Required: Yes ____ No ✓ [TRANSFERRED]

K O Huebschman Jr — Prepared by
WEG #3 — Section
R. G. Lumley 11/17/82 — Section Leader
G. D. Collins — Project Engineer
Released: — Design Project Manager
2/14/83 — Date

SCOPE

Project WATTS BAR NUCLEAR PLANT Affected Unit(s) 1 & 2

System or Feature AUXILIARY FEEDWATER CONTROL SYSTEM (46)

Reference & Description of Change REVISE LIMIT SWITCH OPERATION SUCH THAT THE CONTROL CIRCUITRY FOR THE "TRIP AND THROTTLE" VALVE (FCV-1-51) OPERATES WHEN THE "TRIP AND THROTTLE" VALVE IS HALF OPEN. REF: BLACK & VEATCH FINDING E129

DRAWINGS OR M/M'S INVOLVED: (Sheets Required)

	Yes or No	Date Branch Data Sheet Available
DESIGNATED SUPPORT BRANCHES		
Civil	NO	
Electrical	NO	
Mechanical	NO	
Nuclear	NO	
NUCLEAR PROJECTS DESIGN GROUPS		
Civil	NO	
Electrical E2, E3	YES	
Mech	NO	
FOSSIL, HYDRO & SPECIAL PROJECTS DESIGN		
SPECIAL DESIGN PROJECTS	NO	
ARCHITECTURAL SUPPORT BRANCH	NO	

Designated Support Branches Approval Required	Yes or No
	YES

ECN is ready for branch review:
K E Lumley for Design Project Manager — 1-24-83 Date

Approved:
N/A per CIVIL BR. CHIEF — Date
F. W. Crandall for ELECTRICAL BR. CHIEF — 2-9-83 Date
N/A per MECHANICAL BR. CHIEF — Date
J. D. Wilder for Chief Nuclear Engineer — 2-11-83 Date

	Yes or No
Required for PSAR or FSAR	NO
Required for Preoperational Test:	YES AMS WBP
If Yes, Test No.	TVA 22 2-14-83
Vendor Backcharges Involved	NO
Seismic Analysis Required	NO
Nonconformance Report Required	NO
QA Applies	NO YES
Security System Modified	NO
Vendor(s) Involved:	NONE

PHYSICAL WORK MUST BE DONE BEFORE:

	Pre-Op Test	1st Fuel Load	5% Therm Power	Comm'l Oper'n	1st Refuel	
Unit(s) 1 & 2		✓				
Unit(s)						

WBP 830624 525

CC (Attachments): CD - Yes (✓)

CHIEF, ARCHITECTURAL SUPPORT BRANCH, WT2C10 C-K
CHIEF, CIVIL ENGINEERING BRANCH, WT2C10 C-K
CHIEF, ELECTRICAL ENGINEERING BRANCH, WT2C10 C-K
CHIEF, MECHANICAL ENGINEERING BRANCH, WT2C10 C-K
CHIEF, NUCLEAR ENGINEERS, WT2C10 C-K

CHIEF, COST PLANNING AND CONTROL STAFF, WT2C10 C-K
CHIEF, SPECIAL DESIGN PROJECTS, WT2C10 C-K
MANAGER OF CONSTRUCTION, WT2C10 C-K
PROJECT ENGINEER
WBNP, WBN1 C-K

CLOSED
Closure 3-4-83

WATTS BAR NUCLEAR PLANT
B&V PROJECT 10520

ECN NO. 3883
ATTACHMENT 1
SHEET 1 OF 1

FINDINGS REPORT

FINDING NUMBER	FINAL CLASSIFICATION
F 1 2 9	TYPE ☐ CATEGORY ☐ (FILLED IN BY SENIOR REVIEW TEAM CHAIRMAN)

DESCRIPTION: REF. TVA DWGS 45W600-66-6, REV. 4 AND 45N600-57-5, REV. 2

THE LIMIT SWITCH THAT ACTUATES RELAY 88 WHICH, IN TURN, INTERLOCKS WITH TIME DELAY RELAY TD1 IS SHOWN TO OPERATE WHEN THE "TRIP AND THROTTLE VALVE" (FCV-1-51) IS FULLY OPEN. THIS DOES NOT AGREE WITH LOGIC DIAGRAMS 46W611-3-3 REV 2 AND 46W611-3-4 REV 2 WHICH INDICATE THAT THE LIMIT SWITCH ACTUATES WHEN FCV-1-51 IS HALF OPEN.

INITIATED BY Randy J. Kriesel DATE Oct 29, 1982

LEAD REVIEWER'S ACTION

REMARKS: Discrepancy was verified.

SIGNATURE R.J. Gunnerson DATE Oct. 29, 1982

RECOMMENDED CLASSIFICATION
TYPE D
CATEGORY A

PROJECT MANAGER'S ACTION

REMARKS:

SIGNATURE _____ DATE _____

RECOMMENDED CLASSIFICATION
TYPE _____
CATEGORY _____

SENIOR REVIEW TEAM ACTION (COMPLETE FINAL CLASSIFICATION IN BOX ABOVE)

REMARKS:

SIGNATURE _____ DATE _____
(CHAIRMAN)

SHEET 1
CONT'D ON SHEET ___

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3683
DATA SHEET NO. 1

BRANCH SWP
PAGE 1

To: Watts Bar Nuclear Plant, Spring City, TN

From: Design Project Manager SWP 204 GBK

Released By: G. O. Collins for Design Project Manager

Date: FEB 14 1983

Preparing Section	SWP WEG #3
Prepared By:	K.O. HUEBSCHMAN
Total Pages (RO):	2
Section Supervisor:	F. F. Laney
Staff Eng. or Architect:	N/A
Group Head:	G. O. Collins
Branch Chief:	Date

	MEDS Accession No.		MEDS Accession No.
RO	SWP 830214 565	R4	
R1		R5	
R2		R6	
R3		R7	

SCOPE

Project: WATTS BAR NUCLEAR PLANT — Affected Units: 1 & 2

System or Feature: FEEDWATER CONTROL SYSTEM (46)

Reference & Description of Change: REVISE LIMIT SWITCH OPERATION SUCH THAT THE CONTROL CIRCUITRY FOR THE "TRIP AND THROTTLE" VALVE (FCV-1-51) OPERATES WHEN THE "TRIP AND THROTTLE" VALVE IS HALF OPEN.

REF: BLACK AND VEATCH FINDING F129

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES

Rev. No. N/A
Remarks as follows: N/A

Additional Information: NO IJ, 20MHS, CAT C, 1ST FL, TRANSFERRED

CHIEF, COST PLANNING AND CONTROL STAFF, W12C70 C-K
CHIEF, ARCHITECTURAL SUPPORT BRANCH, WOC120 C-K
CHIEF, CIVIL ENGINEERING BRANCH, W9D220 C-K
CHIEF, ELECTRICAL ENGINEERING BRANCH, W9C120 C-K
CHIEF, SPECIAL DESIGN PROJECTS, W12C20 C-K

PLANT SUPERINTENDENT
CONSTRUCTION PROJECT MANAGER
MEDS, W10A8 C-K
ADMIN, 640 CST2-C

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3683
DATA SHEET NO. 1

AFFECTED UNIT	DRAWING OR S/N NUMBER	CHG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1 & 2	45W600-46-6	5	5-2-83	5-3-83		

EN NO. 3650
ATTACHMENT
SHEET 1 OF 1

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

MEDS Accession No. SWP 820 1221 019

[1] REPORT NO. WBNSWP8267

[2] PLANT WATTS BAR NUCLEAR PLANT [3] UNIT 1

[4] PREPARER/ORGANIZATION/DATE J. D. Collins/SWP/December 21, 1982

[5] DESCRIPTION OF CONDITION

Electrical drawing discrepancies have been identified on the logic, control, schematic, and connection drawings for the auxiliary feedwater system as a result of the Black and Veatch third party independent review. The Black and Veatch finding numbers are:

F101, F102, F103, F104, F105, F106, F107, F110, F111, F114, F115, F116, F117, F123, F124, F127, F130, F131, F141, F802, F803, F804, F805, F806

Approximately 24 drawings have been identified with minor discrepancies.

[6] DATE OF OCCURRENCE EST (X), ACT. ( ) 1978

[7] METHOD OF DISCOVERY Third Party Review

[8] ID CODE (EN DES-EP 8.01)

[9] SIGNIFICANT CONDITION ADVERSE TO QUALITY YES ☐ NO ☒

[10] *BRANCH CHIEF/DATE for EHCh 12/21/82

[11] CORRECTIVE ACTION:

[12] CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES ☐ NO ☐

[13] DESIGN CRITERIA DOCUMENT NO. EXCEPTION REQUEST NO.

[14] ECN REQUIRED ☐ YES ☐ NO ☐ (CN NO.)

[15] SCHEDULE IMPACT ☐ P ☐ A ☐ N

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3650
DATA SHEET NO. 1

BRANCH SWP
PAGE 1

Watts Bar Nuclear Plant

To:
From: Design Project Manager SWP 204 GB-K
Date: JAN 20 1983

Released By: G. D. Collins, Design Project Manager

		MEDS Accession No.		MEDS Accession No.
Preparing Section: E2	R0	SWP '83 0120 525	R4	
Prepared By: CHARLES C. FISHER	R1	SWP '83 0214 544	R5	
Total Pages (R0): R2				
Section Supervisor: [signature]	R2	SWP '83 0308 522	R6	
Staff Eng. or Architect: N/A				
Group Head: G. D. Collins	R3		R7	
Branch Chief: Date				

SCOPE

Project WATTS BAR NUCLEAR PLANT Affected Units 1 & 2

System or Feature (3) AUXILIARY FEEDWATER SYSTEM

Reference & Description of Change CORRECT DRAWINGS PER BLACK & VEATCH FINDINGS ~~F~~ cor; F803; ~~F~~ cor; F806; ~~F~~ cor; F111; F115; ~~F~~ cor; F117; F127; F133; F141.

CLOSED
DATE AUG 26 1983

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
1	2-14-83	CCF	[signature]	[signature]	N/A	HH	[initials]	DELETED 2 DWGS & ADDED 5 DWGS	2
2	3-8-83	REC	[signature]	[signature]	N/A	HH	[initials]	DELETED 1 DWGS	

Reqn. No. N/A NO PR REQ'D
Fix Materials as follows:

Additional Information:

CHIEF, COST PLANNING AND CONTROL STAFF, W12C76 C-K
CHIEF, ARCHITECTURAL SUPPORT BRANCH, W8C126 C-K
CHIEF, CIVIL ENGINEERING BRANCH, W9D224 C-K
CHIEF, ELECTRICAL ENGINEERING BRANCH, W8C126 C-K
CHIEF, SPECIAL DESIGN PROJECTS, W8D224 C-K

PLANT SUPERINTENDENT
CONSTRUCTION PROJECT MANAGER
MEDS, W5B63 C-K
ANRS, 640 CST2-C

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3650
DATA SHEET NO. 1

PAGE 2

AFFECTED UNIT	DRAWING OR SKD NUMBER	CHNG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE OMITTED ON DATA SHEET REV. NO.
1 & 2	45N600-3-3	3	3-11-83	3-7-83	PSAR Fig. Q.S1.147-3	
1 & 2	45N600-3-4	3		↓	PSAR Fig. Q.S1.147-4	
~~1 & 2~~	~~45W600-37-26~~				DELETE	2
1 & 2	45W751-4	12		2-9-83		
1 & 2	45W751-10	11		2-9-83		
~~1 & 2~~	~~45W760-3~~				DELETE	1
~~1 & 2~~	~~45W760-4~~				DELETE	1
1	45B1767-2A	7		2-9-83		
[redacted]	[redacted]					
1	45W1767-4	10		2-9-83		
[redacted]	[redacted]					
1	45W1769-5	4		2-9-83		
1	45W1769-6	3	↓			
2	45B2769-2A	7				1
1 & 2	45W760-3-4	7				1
1 & 2	45W760-3-3	7				1
2	45B2767-2A	7				1
1	45B1769-2A	7	↓	↓		1

SCOPE OF CHANGE ESTIMATE

WATTS BAR NUCLEAR PLANT ECN NO. 3650

BUILDING AUXILIARY

SYSTEM/FEATURE: (3) AUXILIARY FEEDWATER SYSTEM

☑ Revisions by this section will not require additional material.

☐ Revisions by this section will require additional materials as listed below

Item	Unit 1 Qty	Unit 2 Qty	Procured By (EN DES/CONST)	PR, Reqn, or Contr	Requested Delivery Date	Remarks

Charles C. Fisher III
Preparer

Section Supervisor

ENGINEERING CHANGE NOTICE
COVER SHEET SWP '82 1129 506

(BEFORE ISSUANCE OF OPERATING LICENSE)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ECN NO. 2816

To: Construction Project Manager Watts Bar Nuclear Plant, Spring City, TN

From: Design Project Manager SWP 204 GB-K

830210F0138

DATE NOV 29 1982

Budget item 221

Was IJ Analysis Required: Yes ____ No ✓

D.K. FIGURNOV — Prepared by
SWP SECT. #3 — Section
F.F. GENCAY 11/26/82 — Section Leader
G. D. Collins — Project Engineer
Released: — Design Project Manager
11/26/82 — Date

SCOPE

Project WATTS BAR NUCLEAR PLANT — Affected Unit(s) 1+2

System or Feature MAIN CONTROL BOARD MODIFICATIONS.

Reference & Description of Change DOCUMENTATION CHANGE ONLY. NO MATERIALS OR CONST CRAFT MAN-HOURS REQUIRED.

DRAWINGS OR B/MS INVOLVED: Yes ____ Date Branch ____ Sheet ____ Table ____

CLOSED

DATE JAN 31 1983

ENGINEERING SUPPORT DISCIPLINES

Civil	NO
Electrical	YES
Mechanical	NO
Nuclear	NO

NUCLEAR PROJECTS DESIGN GROUPS

Civil	NO
Electrical ES only.	YES
Mech	NO

FOSSIL, HYDRO & SPECIAL PROJECTS DESIGN

SPECIAL DESIGN PROJECTS	NO
ARCHITECTURAL SUPPORT BRANCH	NO

ENGINEERING SUPPORT DISCIPLINES	Yes or No
Approval Required	No
ECN is ready for branch review:	
Design Project Manager	Date
Approved:	
BRANCH CHIEF, CIVIL	Date
BRANCH CHIEF, ELECTRICAL	Date
BRANCH CHIEF, MECHANICAL	Date
Chief Nuclear Engineer	Date

SWP 830210F0138

	Yes or No
Required for PSAR or FSAR	NO
Required for Preoperational Test:	NO
If Yes, Test No.	NO
Vendor Backcharges Involved	NO
Seismic Analysis Required	NO
Nonconformance Report Required	NO
QA Applies	NO
Security System Modified	NO
Vendor(s) involved:	NONE

PHYSICAL WORK MUST BE DONE BEFORE:

	Pre-Op Test	1st Fuel Load	5% Therm Power	Comm'l Oper'n	1st Refuel	
Unit(s) 1						
Unit(s) 2						

CC (Attachments): (X) YES ( )

* NO CONST MAN HR IS INVOLVED

TVA 10878C (EN DES-2-83)

ENGINEERING CHANGE NOTICE COVER SHEET

WBP '831102 518

(BEFORE ISSUANCE OF OPERATING LICENSE)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ECN No. 4358

TO: Construction Project Manager Watts Bar Nuclear Plant, Spring City, TN

From: NPD Project Manager WBP 204 GB-K 8403038701 *12

DATE 10-31-83

Was IJ Analysis Required: Yes ____ No X

T. M. Barker — Prepared by

WBP ELECTRICAL #2 — Section

Section Leader

Q. D. Collins — Project Engineer

Released: — (NPD Project Manager)

11/2/83 — Date

SCOPE

Project WATTS BAR N.P. Affected Unit(s) 1 & 2

System or Feature SYSTEMS 70, 72, 74

Reference & Description of Change TASK FORCE EXPANDED REVIEW CATEGORY 3 & 4 DRAWING ERRORS. (Black and Veatch)

DOCUMENTATION CHANGE ONLY

NO MATERIAL OR CONSTRUCTION CRAFT MANHOURS REQUIRED

DRAWINGS OR B/M'S INVOLVED: (Data Sheets Required)	Yes or No	Date Data Sheet Available
CIVIL ENGR SUPPORT BRANCH	NO	
ELEC ENGR SUPPORT BRANCH	NO	
MECH ENGR SUPPORT BRANCH	NO	
NUCLEAR ENGR SUPPORT BRANCH	NO	
ARCH. SUPPORT BRANCH	NO	
SPECIAL DESIGN PROJECTS	NO	
NUCLEAR PROJECTS DESIGN GROUPS	NO	NA
Civil	NO	
Electrical	YES	
Mechanical	NO	

SUPPORT BRANCHES APPROVAL REQUIRED	Yes or No NO
ECN is ready for support branch review:	
NPD Project Manager	Date
Approved:	
Civil Support Br. Chief	Date
Electrical Support Br. Chief	Date
Mechanical Support Br. Chief	Date
Chief Nuclear Engineer	Date
Arch. Support Br. Chief	Date

PHYSICAL WORK MUST BE DONE BEFORE: NA	Pre-Op Test	1st Fuel Load	
Unit(s)			
Unit(s)			

852

2-23-84 121

DATE CLOSED

WBP 840223 568

	Yes or No
Required for PSAR or FSAR	NO
Required for Preoperational Test:	NO
If Yes, Test No.	
Vendor Backcharges Involved	NO
Seismic Analysis Required	NO
Nonconformance Report Required	NO
QA Applies	~~NO~~ YES
Security System Modified	NO
Human Factor Review Required	NO
Pipe Rupture Analysis Required	NO

Vendor(s) involved: NA

cc (Attachments): No Yes ( )

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 4358
DATA SHEET NO. 1

BRANCH WBP
PAGE 1

To: Watts Bar Nuclear Plant, Spring City, TN

From: NPD Project Manager WEP 204 GB-K

Released By: G. O. Collins for NPD Project Manager

Date 11-2-83

...ng Section	WBP ELECTRICAL #2
Prepared By:	T. M. Barker 10-25-83 Date
Total Pages (RO):	3
Section Supervisor:	[illegible]
Staff Eng. or Architect:	NA
Group Head:	G. O. Collins
Br. Chief/ SDP Mgr.:	

	MEDS Accession No.		MEDS Accession No.
R0	WBP 831102 519	R4	
R1	WBP 840105 502	R5	
R2	WBP 840112 511	R6	
R3		R7	

SCOPE

Project WATTS BAR N.P. Affected Units 1 & 2

System or Feature SYSTEMS 70, 72, 74

Reference & Description of Change MINOR DRAWING CORRECTIONS, DOCUMENTATION CHANGES ONLY. NO MATERIALS OR CONSTRUCTION CRAFT MANHOURS REQUIRED. CATEGORY 3 & 4 FINDINGS.

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
1	1-5-84	CCE	[illegible]	JC	/	MK	JCS	DELETED 3 DWGS	3
2	1-12-84	A.H.	[illegible]	JC	/	MK	JCS	ADD 1 DWG.	3

...lo. N

...aterials as follows: NO PR REQUIRED

Additional Information:

TVA 10575A (EN DES-2-83)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 4358
DATA SHEET NO. 1

PAGE 2

AFFECTED UNIT	DRAWING OR S/N NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	FINDING # -REMARKS-	LINE UPDATED ON DATA SHEET REV.?
1&2	45W749-1	16	1-6-84	12-12-83	70-13	
	-2	16		12-22-83	70-67	
	45W751-3	12		11-30-83	72-13	
	-9	14		12-30-83	72-14, 74-11	
	-11	12			70-25, 70-14	
	-12	11		↓	70-23	
	45N600-57-23	5		1-5-84	74-28	
	45W760-70-1	8		12-8-83	70-6, 70-7, 70-47, 70-66	
	-2	9			70-65	
	-5	10			70-19, 70-24	
	-6	9			70-3, 70-26	
	-7	7			70-5, 70-56	
	-8	9			70-8, 9, 10, 11, 15, 20, 44	
	-9	6			70-30	
	-10	8		↓	70-21, 70-38, 70-46	
	45W760-72-1	8		1-3-84	72-10, 11, 20, 25, 41	
	-2	9			72-1, 2, 3, 4	
	-3	10		↓	72-5, 6, 7, 8	
	-4	11		1-3-84	72-11, 24, 26, 27, 32, 33	
	45W760-74-1	7		12-8-83	74-1, 2, 3, 4, 5, 14, 15(3)	
	-2	13		12-12-83	72-19, 74-6, 7, 8, 10, 12, 23	
	-3	9		12-8-83	74-27, 74-32	
↓	-4	10		12-8-83	74-13, 20, 22, 31	
1	45B1766-2C	6		12-22-83	70-37	
	-5B	6		↓	74-21	
	-10D	12		12-22-83	74-19	
	-14D	9		↓	74-30	
	45B1768-14E	6		12-22-83	72-15	
	-5B	7		12-22-83	74-24	
	45B1769-12D	10		↓	70-36	
	-14E	7		12-28-83	70-31	
↓	-15A	7		↓	70-55	
2	45B2766-5B	6		12-22-83	74-21	
	-10D	10		↓	74-19	
	~~45B2768-14E~~				~~72-15~~ DELETE	↑
↓	-5B	6	↓	12-22-83	74-24	

TVA 10575E (EN DES-7-79)

ENGINEERING CHANGE NOTICE NO. 4358

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 1

PAGE 3

AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	FINDING & REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	45W1748-2	12	1-6-84	12-20-83	70-50	
	~~45W1766-3~~				~~74-23~~ DELETE	1
	45W1767-2	8		1-3-84	70-43	
	-5	9		12-22-83	70-52	
	45W1768-1	10		1-3-84	74-23	
	~~-2~~				~~72-17~~ DELETE	1
	45W1769-5	7		1-3-84	~~70-33~~ 70-32	
2	45W2748-4	9		12-20-83	70-51	
1-2	45W760-70-B	10	1-13-84	1-19-84	70-20	2

TVA 10675E (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. ________

DATA SHEET NO. ____

PAGE ☐

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE		REMARKS	LINE UPT ON DATA REV. NO.
			EXPECTED	ACTUAL		

SCOPE OF CHANGE ESTIMATE

WATTS BAR NUCLEAR PLANT ECN NO. 4358

BUILDING AZZ

SYSTEM/FEATURE: 70, 72, 74

[X] Revisions by this section will not require additional material

[ ] Revisions by this section will require additional materials as listed below

Item	Unit 1 Qty	Unit 2 Qty	Procured By (EN DES/CONST)	PR, Reqn, or Contr	Requested Delivery Date	Remarks

T. M. Barker
Preparer

Section Supervisor

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 4358
DATA SHEET NO. 2

BRANCH NSP
PAGE 1

To: Watts Bar Nuclear Plant, Spring City, TN

From: NPD Project Manager WEP 204 GB-K

Released By: G. D. Collins for NPD Project Manager

Date: 11-2-83

ing Section	Electrical #1
Prepared By:	Arnold W. Hutcheson 12-2-83 Date
Total Pages (RO):	2
Section Supervisor:	J. L. Derrow
Staff Eng. or Architect:	NA
Group Head:	G. D. Collins
Br. Chief/ SDP Mgr.:	

	MEDS Accession No.		MEDS Accession No.
R0	WBP '831102 520	R4	
R1	WBP '840110 510	R5	
R2		R6	
R3		R7	

SCOPE

Project: Watts Bar Nuclear Plant — Affected Units: 1 & 2

System or Feature: System 70, 72, 74 ANF 10-11-83

Reference & Description of Change: Task Force Expanded Review Category 3 & 4 Drawing Errors. Documentation Change Only, No Construction Craft Man-Hours Required.

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PREPARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
1	1-10-84	RLD	JLD	JL	/	MR	JCG	Added 1 Drawing and Revised Issue dates	2

No. NA

Materials as follows: NONE

Additional Information: NONE

TVA 10575A (EN DES-2-83)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 4352
DATA SHEET NO. 2

PAGE 2

AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1+2	47W611-70-3	4	~~1-16-84~~ ~~12-26-83~~	1-9-84	WB-70-2, -16, -19, NEW	
	47W611-70-1	6	~~1-16-84~~ ~~12-26-83~~		WB-70-7	1
	47W610-70-3	6	~~1-16-84~~ ~~12-26-83~~		WB-70-85, -89 DWD 12-26-83	1
	47W610-72-1	11	~~1-16-84~~ ~~12-26-83~~		WB-72-9	1
	47W611-72-1	10	~~1-16-84~~ ~~12-26-83~~	↓	WB-72-9	1
↓	47B601-72-0 Series	13	12-26-83	12-15-83	WB-72-9	1
	~~47W611-74-1~~		~~12-26-83~~		~~WB-74-9~~ DEL 12-15-83	
	~~47B601-70 Series~~		~~12-26-83~~		~~CA-70-89~~ DELETED 12-15-83	
1+2	47B601-72-0 (Series)	14	1-16-84	1-10-84		1

SCOPE OF CHANGE ESTIMATE

Attachment 1 To Data Sheet

WATTS BAR NUCLEAR PLANT

ECN NO. 4358

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

Item	Unit 1 Qty	Unit 2 Qty	Procured By (EN DES/CONST)	PR, Reqn, or Contr	Requested Delivery Date	Remarks

Preparer

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 4358
DATA SHEET NO. 3

BRANCH WBP
PAGE 1

To: Watts Bar Nuclear Plant, Spring City, TN
From: NPD Project Manager WB: 204 G2-K
Released By: G. O. Collins for NPD Project Manager
Date: 11-2-83

ng Section	LLEC # 3
Prepared By:	W A LAMBERT — Date 10-17-83
Total Pages (RO):	2
Section Supervisor:	J. F. Lenny 10/19/83
Staff Eng. or Architect:	N/A
Group Head:	G. O. Collins
Br. Chief/ SDP Mgr.:	

	MEDS Accession No.		MEDS Accession No.
R0	WBP 831102 521	R4	WBP 840201 517
R1	WBP 831216 513	R5	
R2	WBP 840104 507	R6	
R3	WBP 840110 501	R7	

SCOPE

Project WATTS BAR N. P. Affected Units 1

System or Feature SYS 70, 72, 74

Reference & Description of Change TASK FORCE EXPANDED REVIEW CATEGORY 3+4 DRAWING ERRORS.
NO MATERIAL REQUIRED
NO CONSTRUCTION WORK INVOLVED
DOCUMENTATION [redacted] CHANGES ONLY

REF: WBP 830929024

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
1	12-16-83	WAL	MK	JDC/G		KLS	JCS,	DELETE DWG	2
2	1-4-84	SC	MK	JDC/G		MK	JCS/G	ADDED DWG & DELETE DWG	2
3	1-10-84	SC	MK	JDC/G		MK	JCS/G	CORRECT DATE	2
4	2-1-84	RAH	MK	JDC/G		MK	JCS/G	ADD DWG	2

No. N/A

Materials as follows:

Additional Information: N/A NO IJ E 2 200 MH

TVA 10575A (EN DES-2-83)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 4358
DATA SHEET NO. 3

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV.
1	45N600-70	2	~~1-6-84~~ WAC	12-19-83	70-57	
~~1~~	~~45N1645-7~~				~~70-34, 72-29~~ DELETE	2
1	45N1645-9	12		1-6-84	72-36, 72-38	
1	45N1635-80	21		12-29-84	72-44	
1	45W1671-2	6		12-19-83	70-86	
~~1~~	~~45W760-3~~ SC	—			~~70-58~~	
1	45B640-258	2		1-4-84	70-60	
1	45B640-55	4		1-4-84	70-61, 70-62	
~~1~~	~~45B640-182~~ WAC	—			~~70-63~~ WAC	
1	45B640-43	4		1-4-84	70-64	
1	45B640-146	3		↓	70-64	
1	45B640-104	5		1-4-84	72-34, ~~72-35~~ SC	
~~1~~	~~45B640-107~~ WAC	—			~~72-35~~ WAC	
1	45B640-112	2		1-4-84	72-40	
1	45B640-102	4		1-4-84	72-42	
1	45B640-41	4		1-4-84	72-43	
1	45B640-37	5		1-4-84	74-36	
~~1~~	~~47B616-20~~ SC	—			~~72-41~~ SC	
~~1~~	~~47W810-70-3~~ SC	—			~~70-85~~ SC	
1	45BM282-2	14		12-16-83	70-69	
~~1~~	~~45N282-1~~				~~70-75~~ DELETE	1
1	45N282-1	15		12-16-83	70-82; 70-83	
1	45N282-2	20	↓	12-16-83	70-84	
1	45N1660-11	9	↓	1-4-84	70-58	
1	45N1645-8	11	↓	1-6-84	72-24, 72-29	
1	176-23A4 sh 1	906	↓	12-16-83	70-22	
1	45B640-36	4	1-6-84	1-4-84	74-35 ADD	2
1	45N600-55-41	4	1-13-84	1-10-84	72-29 ADD, DATE	3
1	45N600-55-34	3	1-31-84	2-1-84	70-20 ADD	4

SCOPE OF CHANGE ESTIMATE

WATTS BAR NUCLEAR PLANT ECN NO. 4358

BUILDING AUXILIARY

SYSTEM/FEATURE: 70, 72, 74

☒ Revisions by this section will not require additional material

☐ Revisions by this section will require additional materials as listed below

Item	Unit 1 Qty	Unit 2 Qty	Procured By (EN DES/CONST)	PR, Reqn, or Contr	Requested Delivery Date	Remarks

William A. Lambert
Preparer

C. F. Gainey
Section Supervisor

TVA 10570C (EN DES-2-83)

ENGINEERING CHANGE NOTICE COVER SHEET

WBP 831107 512

(BEFORE ISSUANCE OF OPERATING LICENSE)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ECN No. 4360

TO: Construction Project Manager Watts Bar Nuclear Plant, Spring City, TN
WEP 204 GB-K

From: NPD Project Manager

DATE 10-31-83

840214F0321

(12)

Was IJ Analysis Required: Yes ____ No X

T.M. Barker — Prepared by
WBP ELECTRICAL #2 — Section
Section Leader

Q. O. Collins — Project Engineer
Released: — NPD Project Manager
11/7/83 — Date

SCOPE 11/3

Project WATTS BAR N.P. Affected Unit(s) 1

System or Feature SYSTEM 70, 72, 74

Reference & Description of Change TASK FORCE EXPANDED REVIEW CATEGORY 2 DRAWING ERRORS. (Black and Veatch)

XFR PKG: X-70 (1), (2), (4), (5); X-72 (1)

DRAWINGS OR B/M'S INVOLVED: (Data Sheets Required)	Yes or No	Date Data Sheet Available
CIVIL ENGR SUPPORT BRANCH	NO	
ELEC ENGR SUPPORT BRANCH	NO	
MECH ENGR SUPPORT BRANCH	NO	
NUCLEAR ENGR SUPPORT BRANCH	NO	
ARCH. SUPPORT BRANCH	NO	
SPECIAL DESIGN PROJECTS	NO	
NUCLEAR PROJECTS DESIGN GROUPS	NA	NA
Civil	NO	
Electrical	YES	
Mechanical	NO	

SUPPORT BRANCHES APPROVAL REQUIRED	Yes or No NO
ECN is ready for support branch review:	
NPD Project Manager	Date
Approved:	
Civil Support Br. Chief	Date
Electrical Support Br. Chief	Date
Mechanical Support Br. Chief	Date
Chief Nuclear Engineer	Date
Arch. Support Br. Chief	Date

PHYSICAL WORK MUST BE DONE BEFORE:

	Pre-Op Test	1st Fuel Load
Unit(s) 1		X
Unit(s)		

85-

UNIT 2: ECN 4359 DATE 1-23-84 CL SH 118

	Yes or No
Required for PSAR or FSAR	NO
Required for Preoperational Test:	NO
If Yes, Test No.	
Vendor Backcharges Involved	NO
Seismic Analysis Required	NO
Nonconformance Report Required	NO
QA Applies	~~NO~~ YES
Security System Modified	NO
Human Factor Review Required	NO
Pipe Rupture Analysis Required	NO
Vendor(s) involved: NA	

WBP 840123 533

cc (Attachments): No - Yes ( )

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 4360
DATA SHEET NO. 1

BRANCH WBP
PAGE 1

To: Watts Bar Nuclear Plant, Spring City, TN
From: NPD Project Manager WEP 204 GB-K
Released By: G. D. Collins for NPD Project Manager
Date: 11-7-83

Originating Section	WBP ELECTRICAL #2
Prepared By:	T. M. Parker Apr-15-83 Date
Total Pages (RO):	3
Section Supervisor:	[signature]
Staff Eng. or Architect:	NA
Group Head:	G. D. Collins
Br. Chief/ SDP Mgr.:	

	MEDS Accession No.		MEDS Accession No.
RO	WBP '831107 513	R4	
R1	WBP '831208 526	R5	
R2		R6	
R3		R7	

SCOPE

Project: WATTS BAR N.P. Affected Units: 1

System or Feature: SYSTEMS 70, 72, 74

Reference & Description of Change: VARIOUS CORRECTIONS TO DRAWINGS WHICH WILL REQUIRE FIELD MODIFICATIONS. CATAGORY 2 FINDINGS.

CL

DATE

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
1	12-83	AH	[signature]	[signature]	[signature]	MK	JCS	DELETE 2 DWGS, ADD 1 DWG	3

No. ~

...aterials as follows:

Additional Information: NO PR REQUIRED

TVA 10575A (EN DES-3-83)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 4360
DATA SHEET NO. 1

PAGE 2

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	FINDING # — REMARKS	LINE UPDATED ON DATA SHEET REV. #
1	[illegible]	[illegible]		[illegible]	[illegible]	
	[illegible]	[illegible]		[illegible]	[illegible]	1
	45W751-6	13		12-30-83	70-17	
	-12	11		↓	70-18	
	45W760-70-3	8		12-8-83	70-39	
	-4	10			70-35	
	-6	8			70-1	
	-9	6		↓	70-29	
	45W760-72-4	11		1-3-84	72-24	
	45NP751-1-1	4		12-27-83	70-29	
	-1-10	2			70-23	
	-1-11	1			70-29	
	-2-6	3			70-42	
	-2-12	1		↓	70-42	
	-2-14	3		12-6-83	70-42	
	-4-4	2		12-27-83	70-42	
	-4-5	4			70-42	
	-4-11	1		↓	70-42	
	-4-12	2		12-6-83	70-42	
	-4-14	2		12-27-83	70-42	
	-4-15	2			70-42	
	-4-16	2		↓	70-42	
	45B1766-4F	2		12-22-83	72-21	
	45B1767-16E	6		12-22-83	70-28	
	45B1768-16D	3		↓	72-22	
	45B1769-15E	8		12-28-83	70-27	
	-18B	3		12-22-83	70-35, 70-39	
	45W1766-3	12		1-3-84	72-16	
	45W1767-2	8		↓	70-34	
	45W1768-3	14		12-22-83	72-18	
	45W1769-4	15		↓	70-33	
	-7	7		1-3-83	70-35, 70-39	
	GE 0123D4591	906		12-8-83	72-12	
	0123D4593-2	910		1-5-84	74-15 (A)	
	0126D4528	908		12-8-83	74-17	
	0126D4542-2	910		↓	74-17	

TVA 10875E (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 4360

DATA SHEET NO. 1

PAGE 3

CTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	FINDING # REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	45B1766 - 14B	7	12-15-83	12-28-83	74-29	
1	0126D4087	908	〃	12-8-83	74-15(A)	1

TVA 10679E (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. ____________

DATA SHEET NO. ______

PAGE

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE		REMARKS	LINE / ON Dwg. REV. No.
			EXPECTED	ACTUAL		

SCOPE OF CHANGE ESTIMATE

WATTS BAR NUCLEAR PLANT ECN NO. 4820

BUILDING 80X

SYSTEM/FEATURE: 70, 72, 74

☐ Revisions by this section will not require additional material

☐ Revisions by this section will require additional materials as listed below

Item	Unit 1 Qty	Unit 2 Qty	Procured By (EN DES/CONST)	PR, Reqn, or Contr	Requested Delivery Date	Remarks
NAMEPLATES	≈25		CONST			
WIRE TAGS	AS REQ.		CONST			

T. N. Barker
Preparer

Section Supervisor

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 4360
DATA SHEET NO. 2

BRANCH WBP
PAGE 1

To: Watts Bar Nuclear Plant, Spring City, TN

From: NPD Project Manager WSP 204 GB-K

Released By: G. D. Collins for NPD Project Manager

Date: 11-7-83

...ng Section: Electrical Mtce	
Prepared By: [signature] Date: 10-28-83	
Total Pages (RO): 2	
Section Supervisor: J. Elders	
Staff Eng. or Architect: NA	
Group Head: G. D. Collins	
Br. Chief/ SOP Mgr.:	

	MEDS Accession No.		MEDS Accession No.
RO	WBP '831107 514	R4	
R1		R5	
R2		R6	
R3		R7	

SCOPE

Project: Watts Bar Nuclear Plant — Affected Units: 1

System or Feature: Systems 70, 78, 74 and 83

Reference & Description of Change: Task Force Expanded Review Category 2 Drawing Errors

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES

No. NA

Materials as follows: NONE

Additional Information: NONE

TVA 10575A (EN DES-2-83)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 4360
DATA SHEET NO. 2

Page 2

AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	CHG UPDATED ON DATA SHEET REV. NO.
1	47W611-70-3	4	12-28-83	1-9-84	WB-70-29, -35	
↓	47W610-70-3	6	↓	✓	WB-70-29	
↓	47B601-70-Series	15	↓	11-10-83	WB-70-29	

SCOPE OF CHANGE ESTIMATE

Attachment 1 To Data Sheet

WATTS BAR NUCLEAR PLANT

ECN NO. 4260

BUILDING TVA

SYSTEM/FEATURE: System 70, 72, 74

☒ Revisions by this section will not require additional material

☐ Revisions by this section will require additional materials as listed below

Item	Unit 1 Qty	Unit 2 Qty	Procured By (EN DES/CONST)	PR, Reqn, or Contr	Requested Delivery Date	Remarks

Preparer

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 4360
DATA SHEET NO. 1

BRANCH WBP
PAGE 1

To: Watts Bar Nuclear Plant, Spring City, Tn

From: NPD Project Manager [illegible]

Released By: G. D. Collins, NPD Project Manager

Date: 11-7-83

ng Section: LEC NO. 3	
Prepared By: W A LAMBERT — Date: 10-17-83	
Total Pages (RO): 2	
Section Supervisor: [signature]	
Staff Eng. or Architect: N/A	
Group Head: G. D. Collins	
Br. Chief/ SDP Mgr.:	

MEDS Accession No.		MEDS Accession No.	
R0	WBP 831107 515	R4	
R1	WBP 831205 536	R5	
R2		R6	
R3		R7	

SCOPE

Project: WATTS BAR N. P. — Affected Units: 1

System or Feature: SYS 70, 72, 74

Reference & Description of Change: TASK FORCE EXPANDED REVIEW CATEGORY 2 DRAWING ERRORS

REF: WBP 830929024

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
1	12-5-83	LAL	[illegible]	[illegible]	N/A	MIC	JCS	DELETE DWGS	2

No. N/A

...terials as follows:

Additional Information: N/A

NO IJ E2 150 MH

TVA 10878A (EN DES-2-83)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 4360
DATA SHEET NO. 3

AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	45NP282-1-X WAL	2	12-15-83	12-13-83	70-70	
1	45NP282-1-7	1		↓	70-71	
1	~~45NP282-1-13~~				~~70-72~~ DELETE	1
1	45NP282-1-14	1		12-5-83	70-73	
1	45NP282-2-1	3			70-74 + (75)	1
1	45NP282-2-4	4			70-76	
1	45NP282-2-5	2			70-77	
1	45NP282-2-6	1			70-78, 70-79	
1	45NP282-2-7	1		↓	70-80, 70-81	
	~~45NP282-2-8~~ WAL				~~70-82, 70-83, 70-84~~ WAL	
1	45NP247-1-9	3		12-5-83	72-45, 74-38	
1	45NP247-1-2	2			74-41	
1	45NP247-2-2	2			74-40	
1	45NP247-2-8	2			72-48	
1	45NP247-2-9	3		↓	74-39	
1	~~45B640-38~~		↓		~~74-35~~ DELETE	1

SCOPE OF CHANGE NOTICE

WATTS BAR NUCLEAR PLANT

ECN NO. 4360

BUILDING AUXILIARY

SYSTEM/FEATURE: 70, 72, 74

☒ Revisions by this section will not require additional material

☐ Revisions by this section will require additional materials as listed below

Item	Unit 1 Qty	Unit 2 Qty	Procured By (EN DES/CONST)	PR, Reqn, or Contr	Requested Delivery Date	Remarks

William A. Lambert
Preparer

P. F. Pennington
Section Supervisor

TVA 10875C (EN DES-2-83)

ENGINEERING CHANGE NOTICE COVER SHEET WBP '840315 518

(BEFORE ISSUANCE OF OPERATING LICENSE)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ECN No. 4666

TO: Construction Project Manager Watts Bar Nuclear Plant, Spring City, TN
WBP 204 GB-K

From: NPD Project Manager

DATE 3-14-84

8407020382 (14)

Was IJ Analysis Required: Yes ____ No ✓

CHARLES C. FISHER — Prepared by
E2 — Section
Julius M. Fontana — Section Leader

J. C. Harris for — Project Engineer
Released: E W Ch — NPD Project Manager
3/15/84 — Date
SCOPE

Project WATTS BAR NUCLEAR PLANT — Affected Unit(s) 1

System or Feature VARIOUS

Reference & Description of Change CORRECT ELECTRICAL DRAWINGS DUE TO REVIEW OF LOGIC & SCHEMATIC DIAGRAM COMPATIBILITY. TASK FORCE EXPANDED REVIEW (BLACK AND VEATCH). FSAR LOGIC AND SCHEMATIC DRAWINGS REVIEW. (Category 3)

DRAWINGS OR B/M'S INVOLVED: (Data Sheets Required)	Yes or No	Date Data Sheet Available
CIVIL ENGR SUPPORT BRANCH	NO	
ELEC ENGR SUPPORT BRANCH	NO	
MECH ENGR SUPPORT BRANCH	NO	
NUCLEAR ENGR SUPPORT BRANCH	NO	
ARCH. SUPPORT BRANCH	NO	
SPECIAL DESIGN PROJECTS	NO	
NUCLEAR PROJECTS DESIGN GROUPS	NA	NA
Civil	NO	
Electrical E1, E2, E3	YES	
Mechanical	NO	

SUPPORT BRANCHES APPROVAL REQUIRED	Yes or No YES
ECN is ready for support branch review: NPD Project Manager	3-13-84 Date
Approved: N/A (see Civil Support Br. Chief	Date
E. W. Chandler Electrical Support Br. Chief	3-14-84 Date
C. C. Chandler (E&I) Mechanical Support Br. Chief	3-15-84 Date
W. R. Lagergren Chief Nuclear Engineer	3-14-84 Date
N/A (see Civil Arch. Support Br. Chief	Date

PHYSICAL WORK MUST BE DONE BEFORE:	Pre-Op Test	1st Plant Load	
Unit(s) 1		✓	
Unit(s)			

	Yes or No
Required for PSAR or FSAR	NO YES (see
Required for Preoperational Test:	NO
If Yes, Test No.	
Vendor Backcharges Involved	NO
Seismic Analysis Required	NO
Nonconformance Report Required	NO
QA Applies	YES
Security System Modified	NO
Human Factor Review Required	NO
Pipe Rupture Analysis Required	NO
Vendor(s) involved:	NO

WBP '840608 530

D285-

UNIT 2 ECN 4667

DDOC

cc (Attachments): No

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 4666
DATA SHEET NO. 1

BRANCH EEB
PAGE 1

To: Watts Bar Nuclear Plant, Spring City, TN

From: NPD Project Manager WBP 204 GB-K

Released By: J. D. Gallina, Jr. NPD Project Manager

Date: 3-15-84

Originating Section	E2
Prepared By: CHARLES C FISHER	Date 3-13-84
Total Pages (RO): (8)	
Section Supervisor: Julio M. Fontanet	
Staff Engr/Architect: NA	
Group Head: J D Gallina, Jr.	
Br. Chief/SDP Mgr.:	

WBN Accession No.		WBN Accession No.	
RO	WBP '840315 519	R4	
R1	WBP '840501 505	R5	
R2	WBP '840525 555	R6	
R3		R7	

SCOPE

Project: WATTS BAR NUCLEAR PLANT — Affected Units: 1

System or Feature: VARIOUS

Reference & Description of Change: CORRECT ELECTRICAL DRAWINGS DUE TO REVIEW OF LOGIC & SCHEMATIC DIAGRAM COMPATIBILITY.

DATE

CLOSURE SH. #

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PREPARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
1	5-1-84	CCF				MK		DELETED 2 DWGS ; ADDED 4 DWGS	2
2	5-28-84	AH				MAD		ADD 2 DWGS	

Reqn. No. N/A NO PR REQUIRED

F ...tails as follows:

A... al Information:

TVA 10575A (EN DES-2-83)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 4666
DATA SHEET NO. 1

PAGE 2

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV.?
~~1~~	~~45N600-87-B-5~~		5-1-84		DELETE	1
~~1~~	~~45W760-30-24~~				DELETE	1
1	45W760-30-7	10		5-1-84		
1	45N600-30-13	6	↓	5-1-84		
1	45W175B-3	4		↓	ADD	
1	45W787-3	10			ADD	
1	45W757-1	12			ADD	
1	45W757-3	6	↓	↓	ADD	
1	45W760-62-5	10	5-25-84	5-25-84	ADD	2
1	↓ -67-8	10	↓	↓	ADD	2

SCOPE OF CHANGE ESTIMATE

WATTS BAR NUCLEAR PLANT ECN NO. 4666

BUILDING AUXILIARY

SYSTEM/FEATURE: VARIOUS

☑ Revisions by this section will not require additional material

☐ Revisions by this section will require additional materials as listed below

Item	Unit 1 Qty	Unit 2 Qty	Procured By (EN DES/CONST)	PR, Reqn, or Contr	Requested Delivery Date	Remarks

Charles C. Fisher
Preparer

Julius M. Lockhart
Section Supervisor

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 4666
DATA SHEET NO. 3

BRANCH WBP
PAGE 1

To: Watts Bar Nuclear Plant, Spring City, TN

From: NPD Project Manager WBP 204 GB-K

Released By: J D Gallina for NPD Project Manager

Date: 3-15-84

Originating Section	WEB No 1
Prepared By:	W H. Denny 3-13-84 Date
Total Pages (RO):	2
Section Supervisor:	J D Gallina
Staff Eng. or Architect:	NA
Group Head:	J D Gallina for
Br. Chief EDP Mgr.:	

	MEDS Accession No.		MEDS Accession No.
R0	WBP '840315 520	R4	
R1	WBP '840412 503	R5	
R2	WBP '840501 524	R6	
R3		R7	

SCOPE

Project WATTS BAR NUCLEAR PLANT Affected Units 1

System or Feature SYS ~~21, 24, 30, 57~~ VARIOUS MP.

Reference & Description of Change CORRECT LOGIC DIAGRAMS DUE TO REVIEW OF LOGIC AND SCHEMATIC DRAWING COMPATIBILITY. TASK FORCE EXPANDED REVIEW (BLACK AND VEATCH). FSAR LOGIC AND SCHEMATIC DRAWING REVIEW

DATE

CLOSURE SH.

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PREPARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
1	4-12-84	[illegible]	[illegible]	JC	FWK	MK	JCS	ADDED 52 DWGS, REV SYS Nº IN SCOPE	3
2	5-1-84	RAD	[illegible]	JC	FWK	MK	JCS	ADDED 5 DWGS	3

No. NA

Materials as follows: NA

Additional Information NA

TVA 10878A (EN DES-2-83)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 4666
DATA SHEET NO. 2

PAGE 2

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	47W611-26-1	10	5-1-84	5-3-84		
1	47W611-26-2	7		↓		
~~1~~	~~47W611-13-6~~ AND 4-30-84				Delete	R2
1	47W611-30-1	4		5-3-84		
1	47W611-30-3	6				
1	47W611-30-6	13		↓		
1	47W611-30-7	4		5-7-84		
1	47W610-1-1	15		5-3-84	ADDED DWG	R1
	47W611-1-1	8		5-3-84		
	47B601-1-SERIES	26		5-16-84		
	47W610-62-2	13		5-10-84		
	47W611-62-1	7		5-1-84		
	47B601-62-SERIES	23		5-10-84		
	47W610-67-3	5		↓		
	47W611-67-3	5		5-10-84		
	47B601-67-SERIES	22		5-16-84		
	47W610-68-5	14		↓		
	47W611-68-3	7		5-16-84		
	47B601-68-SERIES	24		5-9-84		
	47W611-1-3	6		5-3-84		
	47W611-2-1	7		4-19-84		
	47W611-3-1	4		5-3-84		
	47W611-5-1	1		5-1-84		
	47W611-6-1	7		↓		
	47W611-12-1	6		5-3-84		
	47W611-13-1	6		↓		
	47W611-14-1	7		5-1-84		
	47W611-15-1	8		↓		
	47W611-18-1	4		4-19-84		
	47W611-20-1	3		5-1-84		
	47W611-24-1	8		5-3-84		
	47W611-27-1	3		↓		
	47W611-31-1	10		5-3-84		
	47W611-32-1	4		↓		
	47W611-36-1	2		5-1-84		
	47W611-39-1	7		5-3-84		

TVA 10575E (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 4666

DATA SHEET NO. 2

PAGE 3

:CTED NIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
1	47W611-40-1	10	5-1-84	5-1-84	ADDED DWG	R1
	47W611-41-1	6		5-3-84		
	47W611-42-1	1		5-1-84		
	47W611-43-1	4		5-3-84		
	47W611-55-1	2		5-1-84		
	47W611-61-1	4		↓		
	47W611-63-1	5		↓		
	47W611-65-1	6		4-13-84		
	47W611-67-1	5		5-3-84		
	47W611-68-1	4		5-1-84		
	47W611-70-1	7		4-19-84		
	47W611-50	4		5-10-84		
	47W611-72-1	12		5-3-84		
	47W611-74-1	6		↓		
	47W611-77-1	8		5-3-84		
	47W611-78-1	5		5-1-84		
	47W611-81-1	4		↓		
	47W611-82-1	3		5-3-84		
	47W611-87-1	5		5-1-84		
	47W611-88-1	9		↓		
	47W611-99-1	4		↓		
	47E611-928-01	2		5-3-84		
↓	47E611-959-01	2	↓	↓	↓	↓
↓	47W611-32-2	8	↓	5-3-84	ADDED DWG	R2
	47W611-31-7	7		5-3-84	ADDED DWG	R2
	47W611-31-2	8		5-3-84	ADDED DWG	R2
	47W610-3-1	11		5-16-84	↓	R2
↓	47B601-3-SERIES	24	↓	5-7-84		R2

TVA 10675E (EN DES-7-79)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 4666

DATA SHEET NO. 2

PAGE 9

AFFECTED UNIT	DRAWING OR B/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UP ON DATA REV. NO.

[redacted]

SCOPE OF CHANGE ESTIMATE

WATTS BAR NUCLEAR PLANT — ECN NO. 4666

BUILDING VARIOUS

SYSTEM/FEATURE: 24, 26, 30, & 31

☒ REVISIONS BY THIS SECTION WILL NOT REQUIRE ADDITIONAL MATERIAL.

☐ REVISIONS BY THIS SECTION WILL REQUIRE ADDITIONAL MATERIALS AS LISTED BELOW.

ITEM	UNIT 1 QTY	UNIT 2 QTY	PROCURED BY (EN DES/CONST)	PR, REQN, OR CONTR	REQUESTED DELIVERY DATE	REMARKS

[redacted]

David L. Langley
PREPARED

[signature]

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 4666
DATA SHEET NO. 1

BRANCH [illegible]
PAGE 1

To: Watts Bar Nuclear Plant, Spring City, TN
From: NPD Project Manager WBP 204 GB-K
Released By: J. P. Gallina Jr. NPD Project Manager
Date: 3-15-84

		MEDS Accession No.		MEDS Accession No.
Prepared By: Sherry Cutts 3/13/84 Date	R0	WBP '840315 521	R4	
Total Pages (R0): 2	R1		R5	
Section Supervisor: [illegible] 3/14/84	R2		R6	
Staff Eng. or Architect: N/A	R3		R7	
Group Head: J. P. Gallina Jr.				
Br. Chief/SDP Mgr.:				

SCOPE

Project: WATTS BAR NUCLEAR PLANT — Affected Units: 1

System or Feature: SYS 26, (VARIOUS)

Reference & Description of Change: CORRECT ELECTRICAL DRAWINGS DUE TO REVIEW OF LOGIC AND SCHEMATIC DIAGRAM COMPATIBILITY. TASK FORCE EXPANDED REVIEW (BLACK AND VEATCH). FSAR LOGIC AND SCHEMATIC DRAWINGS REVIEW.

DATE

CLOSURE SH. #

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES

Regn. No. NONE

F [illegible] terials as follows: NONE

A [illegible]al Information: CATEGORY: 1ST FUEL LOAD MILESTONE
LEAD: E2 (CHARLES FISHER)
E3: 20 MAN-HOURS

TVA 10575A (EN DES-3-83)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 4666
DATA SHEET NO. 3

PAGE 2

AFFECTED UNIT	DRAWING OR SKM NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE ITEM NO. ON DATA SHEET REV. #
1 (0)	45W600-26-13	4	4-27-84	4-10-84	REMOVE 3000 Y/Y FROM ASSY	

SCOPE OF CHANGE ESTIMATE

WATTS BAR NUCLEAR PLANT ECN NO. 4666

BUILDING - PCDE - SERVICE

SYSTEM/FEATURE: _____

☒ Revisions by this section will not require additional material

☐ Revisions by this section will require additional materials as listed below

Item	Unit 1 Qty	Unit 2 Qty	Procured By (EN DES/CONST)	PR, Reqn, or Contr	Requested Delivery Date	Remarks

Preparer

Section Supervisor

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 4666
DATA SHEET NO. 4

BRANCH [illegible]
PAGE 1

To _____

NPD Project Manager _____

Released By: T. A. Allen Jr. for NPD Project Manager

4-30-84

Preparing Section	WBG-1
Prepared By:	Ronald Cox — 4-24-84 Date
Total Pages (RO):	2
Section Supervisor:	E. E. Munns
Staff Eng. or Architect:	
Group Head:	E. E. Munns
Br. Chief/ SDP Mgr.:	

	MEDS Accession No.		MEDS Accession No.
R0	WBP '840430 521	R4	
R1		R5	
R2		R6	
R3		R7	

SCOPE

Project Watts Bar Nuclear Plant — Affected Units 1

System or Feature VARIOUS

Reference & Description of Change CORRECT ELECTRICAL DRAWINGS DUE TO REVIEW OF LOGIC & SCHEMATIC DIAGRAM COMPATIBILITY. TASK FORCE EXPANDED REVIEW (BLACK AND VEATCH). FSAR LOGIC AND SCHEMATIC DRAWINGS REVIEW. (Category 3)

CLOSED

DATE

CLOSE SH. #

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES

10. N/A

Flow Materials as follows

Additional Information

TVA 10575A (EN DES-2-83)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 4666
DATA SHEET NO. 4

PAGE 2

AFFECTED UNIT	DRAWING OR S/M NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE OUT ON DATA SHT
1	45N800-4	17	5-1-84	4-30-84		
1	45N800-5	14	↓	↓		
1	45W809-3	22				

8307280098 (10)

ENGINEERING CHANGE NOTICE
COVER SHEET SWP '83 0120 500

(BEFORE ISSUANCE OF OPERATING LICENSE)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ECN NO. 3334

To: Construction Project Manager Watts Bar Nuclear Plant, Spring City, TN

From: Design Project Manager SWP 204 GB-R

DATE JAN 20 1983

Budget item 221

Was IJ Analysis Required: Yes ____ No X

CHARLES C. FISHER (Prepared by) — SWP (Section) — E2 — (Section Leader)

G. D. Collins (Project Engineer) — Released: J. C. Standifer (Design Project Manager) — 1-17-83 (Date)

SCOPE

Project WATTS BAR NUCLEAR PLANT — Affected Unit(s) 1 & 2

System or Feature VARIOUS SYSTEMS — NCR WBN-SWP 8267

Reference & Description of Change REVISED SCHEMATIC AND CONNECTION DRAWINGS TO AGREE WITH LOGIC DIAGRAMS ON VARIOUS INSTRUMENT SETTING. REF: BLACK & VEATCH FINDINGS F113; F125; F126; F132; F801; F114; F131 (NCR WBN-SWP 8267)

CLOSED 1-24-83 Closure SH 101

DRAWINGS OR DOCUMENTS INVOLVED: (Data Sheet Attached)	Yes or No	Date Branch Data Sheet Available
Engineering Support Branches		
Electrical	NO	
Mechanical	NO	
Nuclear	NO	
Engineering Projects Design Groups		
Civil	NO	
Electrical E1, E2	YES	
Mechanical	NO	
Fossil, Hydro & Special Projects Design		
Special Design Projects	NO	
Architectural Support Branch	NO	

Engineering Support Branches	Yes or No
Approval Required	YES
ECN is recommended for Branch review: G. D. Collins, Design Project Manager for — Date	12-14-82
Approved:	
N/A — EBS Civil Br. Chief — Date	
F. W. Chandler for — EBS Electrical Br. Chief — Date	12/28/82
N/A — EBS Mechanical Br. Chief — Date	
A. J. Wilde for — Chief Nuclear Engineer — Date	1-7-83

	Yes or No
Required for PSAR or FSAR	YES
Required for Preoperational Test:	NO
If Yes, Test No.	
Vendor Backcharges Involved	NO
Seismic Analysis Required	NO
Nonconformance Report Required	[illegible]
QA Applies	YES
Security System Modified	NO
Vendor(s) involved:	NONE

PHYSICAL WORK MUST BE DONE BEFORE:

	Pre-Op Test	1st Fuel Load	5% Therm Power	Comm'l Oper'n	1st Refuel	
Unit(s) 1 & 2		✓				
Unit(s)						

WBP 830624 508

CC (Attachments): YES (1)

CHIEF, ARCHITECTURAL SUPPORT BRANCH, WSB2L26 C-K
CHIEF, CIVIL ENGINEERING BRANCH, WSB2L26 C-K
CHIEF, ELECTRICAL ENGINEERING BRANCH, WSB2L26 C-K
CHIEF, MECHANICAL ENGINEERING BRANCH, WSB2L26 C-K
CHIEF, NUCLEAR ENGINEER, WSB2L26 C-K
CHIEF, QUALITY ASSURANCE BRANCH, E4B0 WSB-K

CHIEF, UNIT PLANNING AND CONTROL STAFF, WSB2L26 C-K
CHIEF, SPECIAL DESIGN PROJECTS, WSB2L26 C-K
MANAGER OF CONSTRUCTION, E7B26 C-K
PLANT SUPERINTENDENT
WBN, WSB2 C-K

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

MEDS Accession No. SWP 82 1221 019

[1] REPORT NO. WBNEP-82(67

[2] PLANT WATTS BAR NUCLEAR PLANT [3] UNIT 1

[4] PREPARER/ORGANIZATION/DATE J. D. Collins/SWP/December 21, 1982

[5] DESCRIPTION OF CONDITION

Electrical drawing discrepancies have been identified on the logic, control, schematic, and connection drawings for the auxiliary feedwater system as a result of the Black and Veatch third party independent review. The Black and Veatch finding numbers are:

F101, F102, F103, F104, F105, F106, F107, F110, F111, F114, F115, F116, F117, F123, F124, F127, F130, F131, F141, F802, F803, F804, F805, F806

Approximately 24 drawings have been identified with minor discrepancies.

[6] DATE OF OCCURRENCE EST (X), ACT. ( ) 1978

[7] METHOD OF DISCOVERY Third Party Review

UNID CODE (EN DES-EP 8.01)

[9] SIGNIFICANT CONDITION ADVERSE TO QUALITY YES ☐ NO ☒

[10] *BRANCH CHIEF/DATE EHCh 12/21/82

[11] CORRECTIVE ACTION:

[12] CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES ☐ NO ☐

[13] DESIGN CRITERIA DOCUMENT NO. EXCEPTION REQUEST NO.

[14] SCN REQUIRED ☐ YES NO ☐ (CN NO)

[15] SCHEDULE IMPACT ☐ P ☐ A ☐ N

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3334
DATA SHEET NO. 1

BRANCH SWP
PAGE 1

To: Watts Bar Nuclear Plant, Spring City, TN

From: Design Project Manager SWP 204 C&E

Released By: J. D. Collins for Design Project Manager

Date: JAN 20 1983

Preparing Section	WEDS Accession No.		WEDS Accession No.
E2	R0 SWP '83 0120 501	R4	1-
Prepared By: CHARLES C. FISHER	R1 SWP '83 0314 530	R5	
Total Pages (RO): (R1)	R2	R6	
Section Supervisor:	R3	R7	
Staff Eng. or Architect: N/A			
Group Head: J. D. Collins			
Branch Chief: Date			

SCOPE

Project: WATTS BAR NUCLEAR PLANT — Affected Units: 1 2

System or Feature: VARIOUS SYSTEMS

Reference & Description of Change: REVISED SCHEMATIC AND CONNECTION DRAWINGS TO AGREE WITH LOGIC DIAGRAMS ON VARIOUS INSTRUMENT SETTING. REF: BLACK & VEATCH FINDINGS E113; E125; E126; E132; E801; E114; E131.

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PREPARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
1	3-14-83	JED			N/A			Delete 17 Dwgs & ADD 2 DWGS	3

Design No. W-5534
Issued Materials as follows:

Additional Information:

CHIEF, COST PLANNING AND CONTROL STAFF, WT2C70 C-K
CHIEF, ARCHITECTURAL SUPPORT BRANCH, WT2C130 C-K
CHIEF, CIVIL ENGINEERING BRANCH, WT2C90 C-K
CHIEF, ELECTRICAL ENGINEERING BRANCH, WT2C50 C-K
CHIEF, SPECIAL DESIGN PROJECTS, WT2C210 C-K

PLANT SUPERINTENDENT
CONSTRUCTION PROJECT MANAGER
HEDS, WT2A3 C-K
ANSS, 640 CST2-C

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3334
DATA SHEET NO. 1

PAGE 2

AFFECTED UNIT	DRAWING OR SDI NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UNAFFECTED ON DATA SHEET (INITIAL)
1 2 2	45N720	11	~~3-1-83~~ 3-4-83	3-9-83		
1 2 2	45N721-1	7				
1 2 2	45W760-2-3	6				
1 2 2	45W760-6-1	6				
1 2 2	45W760-6-2	5				
1 2 2	45W760-27-1	5				
1 2 2	45N600-35-2	6		3-7-83		
1 2 2	45N600-35-3	4				
1 2 2	45N600-3-2	4			FSAR Fig. Q 31.141-2	
1 2 2	45N600-3-3	3			FSAR Fig. Q 31.141-3	
1 2 2	45N600-3-4	3			FSAR Fig. Q 31.141-4	
1 2 2	45N600-3-6	4				
1 2 2	45N600-3-7	3				
1 2 2	45N600-3-8	2				
1 2 2	45N600-3-9	2				
1 2 2	45N600-47-1	3				
1 2 2	45N600-47-2	5				
1 2 2	45N600-47-4	4				
1 2 2	45N600-47-5	4		2-28-83		
1 2 2	45N600-47-6	7		3-7-83		
1 2 2	45N600-47-7	5				
1 2 2	45N600-47-8	5				
1 2 2	45N600-47-10	1				
1	~~45N1688-2~~				Delete	1
1	~~45N1690-1~~					1
1	~~45N1690-2~~					1
1	~~45N1691-1~~					1
1	~~45N1691-2~~					1
1	~~45N1693-2~~					1
1	~~45N1694-2~~					1
2	~~45N2685-1~~					1
2	~~45N2686-1~~					1
2	~~45N2688-2~~					1
2	~~45N2690-1~~					1
2	~~45N2690-2~~					1
2	~~45N2691-1~~					1

TVA 19975E (EN DES-7-79)

... OF ENGINEERING CHANGE NOTICE NO. 3334

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

PAGE 3

AFFECTED UNIT	DRAWING OR SAI NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATED ON DATA SHEET REV. NO.
~~2~~	~~45N2691-2~~	~~-~~	~~3-1-83~~		Delete	1
~~2~~	~~45N2693-2~~				↓	1
~~2~~	~~45N2694-2~~					1
1&2	45W760-3-1	5	3-14-83	1-20-83		
1&2	45W760-3-2	6		3-2-83		
1&2	45W760-3-3	7		2-9-83		
1&2	45W760-3-4	7		↓		
1&2	45W760-3-11	3		3-2-83		
1	45B1767-2A	7		2-9-83		
1	45B1769-2A	7		2-9-83		
2	45B2767-2A	7		↓		
2	45B2769-2A	7		↓		
1&2	45W751-4	12		2-9-83		
1&2	45W751-10	11		↓		
~~1&2~~	~~45W760-30-21~~				Delete	1
1&2	45W760-30-23	3	↓	3-2-83		
1&2	45W760-62-2	7	↓	↓		
1	45BM751	0	↓	↓		
1	45B1767-0	10	↓	↓		
1	45B1767-02	1	↓	↓		
1	45B1769-0	7	↓	↓		
1	45B1769-02	0	↓	↓		
2	45B2767-0	9	↓	↓		
2	45B2767-02	1	↓	↓		
2	45B2769-0	0	↓	↓		
2	45B2769-02	1	↓	↓		
	45N600-57-5	4	↓	3-1-83		
	45N600-57-22	2	↓	3-9-83		
	45N600-57-24	3	↓	3-1-83		
	45N600-57-26	2	↓	2-11-83		
	45N600-57-31	4	↓	3-1-83		
	~~45N600-57-33~~		↓		Delete	8
	45N600-2	4	3-14-83	3-1-83		
	45N600-5-1	2	↓	↓		
	45N600-6-2	3	↓	↓		
	45N600-7	4	↓	↓		

TVA 10579E (EN DES-7-79)

ENGINEERING CHANGE NOTICE NO. 3334

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

DATA SHEET NO. 1

PAGE 4

AFFECTED UNIT	DRAWING OR SKI NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE UPDATE CRITERIA SK DES. NO.
1	45B1769-01-C	6	3-11-83	3-2-83		1
1,2	45W760-30-37	2	↓	↓		1

SCOPE OF CHANGE ESTIMATE

WATTS BAR NUCLEAR PLANT ECN NO. 3334

BUILDING AUXILIARY

SYSTEM/FEATURE: VARIOUS

☐ Revisions by this section will not require additional material.

☑ Revisions by this section will require additional materials as listed below

Item	Unit 1 Qty	Unit 2 Qty	Procured By (EN DES/CONST)	PR, Reqn, or Contr	Requested Delivery Date	Remarks
TIME DELAY RELAYS	2	2	EN	W-3534	1-17-83	

Charles C. Fisher
Preparer

Section Supervisor

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 3534
DATA SHEET NO. 2

Watts Bar Nuclear Plant, Spring City, TN

BRANCH SWP

PAGE 1

To:

From: Design Project Manager SWP 204 GB-R

As: JAN 20 1983

Released By: G. D. Collins
Design Project Manager

Preparing Section	ELECTRICAL #1
Prepared By:	R. T. GRAHAM
Total Pages (R0):	2
Section Supervisor:	[signature]
Staff Eng. or Architect:	N/A
Group Head:	G. D. Collins
Branch Chief:	

	MEDS Accession No.		MEDS Accession No.
R0	SWP '83 0120 502	R4	
R1	SWP '83 0304 538	R5	
R2	SWP '83 0412 511	R6	
R3		R7	

SCOPE

Project: WATTS BAR NUCLEAR PLANT — Affected Units: 1 & 2

System or Feature: VARIOUS SYSTEMS

Reference & Description of Change: REVISE TIME SETTINGS ON LOGIC DIAGRAMS TO AGREE WITH THE FSAR.

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES
1	3-4-83	DP	[initials]	[initials]	N/A	[initials]	JCS	ADD 31 SYS LOGIC TO DATA SHEET & REV. ISSUE SHEET	1
2	4-12-83	DP	[initials]	[initials]	N/A	[initials]	JCS	ADDED 2 DWG	2

...gn. No. N/A

...d Material as follows: NA

Additional Information:

[illegible distribution list]

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 2334
DATA SHEET NO. 2

PAGE 2

AFFECTED UNIT	DRAWING OR SKD NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL		REMARKS	LEAD LOCATION ON DATA SHEET REV. NO.
1 & 2	47W611-3-3	3	~~5-1-83~~ 4-15-83	4-13-83		FSAR Rev 28.4-11. Rev. 24's Date	1
	47W611-62-4	3		5-4-83		+	1
↓	47W611-67-1	4	↓	3-15-83		FSAR Rev. 9.2-16 Rev. 23's Date	1
1 & 2	~~47W611-31-4~~		~~4-30-83~~			ADDED DWG. DELETED DWG	1
1 & 2	47W611-31-4	4	4-15-83	4-6-83		Add DWG.	2

SCOPE OF CHANGE ESTIMATE

WATTS BAR NUCLEAR PLANT

ECN NO. 3334

BUILDING VARIOUS

SYSTEM/FEATURE: VARIOUS

☑ Revisions by this section will not require additional material

☐ Revisions by this section will require additional materials as listed below

Item	Unit 1 Qty	Unit 2 Qty	Procured By (EN DES/CONST)	PR, Reqn, or Contr	Requested Delivery Date	Remarks

Preparer

Section Supervisor

TVA 10570C (EN DES-3-83)

ENGINEERING CHANGE NOTICE COVER SHEET WBP '830923 553

(BEFORE ISSUANCE OF OPERATING LICENSE)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ECN No. 4246

TO: Construction Project Manager Watts Bar Nuclear Plant, Spring City, TN

From: NPD Project Manager SWP 204 G8-K

DATE 8-26-83

8311210344 (4)

Was IJ Analysis Required: Yes ____ No ✓

Robert S. Antolak	Electrical No. 1	J. L. Davis
Prepared by	Section	Section Leader
J. L. Davis for Project Engineer	Released: [signature] NPD Project Manager	9/23/83 Date

SCOPE

Project Watts Bar Nuclear Plant Affected Unit(s) 1+2

System or Feature Residual Heat Removal System (74)

Reference & Description of Change Change pressure channel instrument numbers which interlock the RHR letdown valves (FCV-74-1,2). This documents design changes done under ECN 2329. Also document the "manual" power available interlock as a permissive to automatically close valves FCV-74-3,21 for RHR recirculation after a LOCA.

DRAWINGS OR B/M'S INVOLVED: (Data Sheets Required)	Yes or No	Date Data Sheet Available
CIVIL ENGR SUPPORT BRANCH	No	
ELEC ENGR SUPPORT BRANCH	No	
MECH ENGR SUPPORT BRANCH	No	
NUCLEAR ENGR SUPPORT BRANCH	No	
ARCH. SUPPORT BRANCH	No	
SPECIAL DESIGN PROJECTS	No	
NUCLEAR PROJECTS DESIGN GROUPS	No	NA
Civil	No	
Electrical E1	YES	
Mechanical	No	

SUPPORT BRANCHES APPROVAL REQUIRED	Yes or No Yes
ECN is ready for support branch review: [signature] NPD Project Manager	8/29/83 Date
Approved: N/A per Civil Support Br. Chief	
[signature] F.W. Wyatt for Electrical Support Br. Chief	9-1-83 Date
N/A per Mechanical Support Br. Chief	Date
[signature] for Nuclear Engineer	9-20-83 Date
Architectural Support Br. Chief	Date

PHYSICAL WORK MUST BE DONE BEFORE:	Pre-Op Test	1st Fuel Load	
Unit(s) 1		✓	
Unit(s) 2		✓	

	Yes or No
Required for PSAR or FSAR	Yes
Required for Preoperational Test:	No
If Yes, Test No.	
Vendor Backcharges Involved	No
Seismic Analysis Required	No
Nonconformance Report Required	No
QA Applies	Yes
Security System Modified	No
Human Factor Review Required	No
Pipe Rupture Analysis Required	No
Vendor(s) Involved:	None

85-853

CLOSED MR 11-14-83 Closure Sh 1/2

WBP '831114 565

cc (Attachments): No ~~Yes~~

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 4246

DATA SHEET NO. 1

Watts Bar Nuclear Plant, Spring City, TN

BRANCH WBP

PAGE 1

To:

From: NPD Project Manager SWP 204 GB-K

Released By: G. P. Collins
NPD Project Manager

Date: 9-23-83

ing Section	Electrical No. 1
Prepared By:	Robert L Pebbles 9-23-83 Date
Total Pages (RO):	2
Section Supervisor:	J C Harris
Staff Eng. or Architect:	N/A
Group Head:	J C Harris
Br. Chief/ EDP Mgr.:	

MEDS Accession No.		MEDS Accession No.	
RO	WBP '830923 554	R4	
R1		R5	
R2		R6	
R3		R7	

SCOPE

Project: Watts Bar Nuclear Plant — Affected Units: 1 & 2

System or Feature: Residual Heat Removal System (74)

Reference & Description of Change: Change pressure channel instrument numbers which interlock the RHR letdown valves (FCV-74-1,2). This documents design changes done under ECN 2929. Also document the "normal" power available interlock as a permissive to automatically close valves FCV-74-3, 21 for RHR recirculation after a LOCA.

CLOSED

NRC

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE-PARED	SECT. SUPV.	GROUP HEAD	BRANCH CHIEF	ECN CLERK	D.P. MGR.	DESCRIPTION OF REVISION	TOTAL PAGES

No. N/A

Inserts as follows:

Additional Information:

TVA 10575A (EN DES-3-83)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. 4246
DATA SHEET NO. 1

AFFECTED UNIT	DRAWING OR SVM NUMBER	DWG REV.	ISSUE DATE EXPECTED	ISSUE DATE ACTUAL	REMARKS	LINE VARIATION ON DATA SHEET REVISED
1&2	47W611-74-1	5	9-30-83	9-30-83		

SCOPE OF CHANGE ESTIMATE

WATTS BAR NUCLEAR PLANT

ECN NO. 4246

BUILDING — N/A

SYSTEM/FEATURE: Residual Heat Removal System (74)

☒ Revisions by this section will not require additional material

☐ Revisions by this section will require additional materials as listed below

Item	Unit 1 Qty	Unit 2 Qty	Procured By (EN DES/CONST)	PR, Reqn, or Contr	Requested Delivery Date	Remarks

Robert S. Astbl
Preparer

DUC

840815A0010

BNP-DCP-10.2, R11
ATTACHMENT A
PAGE 1 of 2

(4)

TENNESSEE VALLEY AUTHORITY
FIELD CHANGE REQUEST
REPLY MEMORANDUM

FCR NO. E-3458

BLN 840402 580

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

FROM: Lonnie S. Cox, Project Manager, Bellefonte Nuclear Plant

DATE: 3-30-84 APR 3 1984

O.C.A.R
JUL 17 1984
RECEIVED
RCW

Attention: LEONARD MADISON

SECTION I - CONST REQUEST

DCU-A
AUG 1 1984
REVIEWED FCR

DCR No. NA

Reason for change:
(✓) Drawing Discrepancy
( ) Facilitate Construction
(✓) Additional Design Information

Status Point:
(✓) Prior to Fuel Loading
( ) After Fuel Loading But Prior to Closing Capitalized Accounts
( ) After Closing Capitalized Accounts for Entire Plant

SUPPORT F/L OF UNIT I & II
PC III ACT NO. A2E1
RESP ENGR UNIT EE4-C
RESP ENGR JIMMY CHILDERS

DESCRIPTION

ADD THE NOTES SHOWN ON ATTACHED SKETCHES TO DRAWINGS 4BA0892-X2-5 & 4BA0892-X2-9.

THIS FCR SUPERSEDES FCR E-3453

J.R. Wadsworth 4-22-84

Structure(s)/System(s) Aux Bldg / RU

Contract No. NA

Drawings Affected 4BA0892-X2-5R5 & 4BA0892-X2-9R6

Marked drawings/sketches required and attached? ( ) NO (✓) YES, No. Att's. 2

Change requested by: JIMMY CHILDERS (Responsible Engineer) John T. Robertson (Unit Supervisor)

Initial EN DES Contact: LEONARD MADISON (EN DES Engineer) 3-29-84 (Date)

Welding involved: ( ) NO (✓) YES, Approved by R. Shubeck (WEU Engineer) 3-30-84 (Date)

Change approved by: LEONARD MADISON (DPO Engineer) 3-29-84 (Date)

Approval obtained by: (✓) Telephone ( ) Memo ( ) Site Rep. ( ) Other

Approved for transmittal to EN DES: Edward R. Bennett 3/30/84
MEDS W5B63 C-K Asst. Const. Engr. or Const Engr. or Project Manager

Attachment A
Page 2 of 2

SECTION - EN DES REPLY/RESOLUTION BLP '840709 323

ECN No. 51, BOTH DWGS. Date Issued 7-6-84

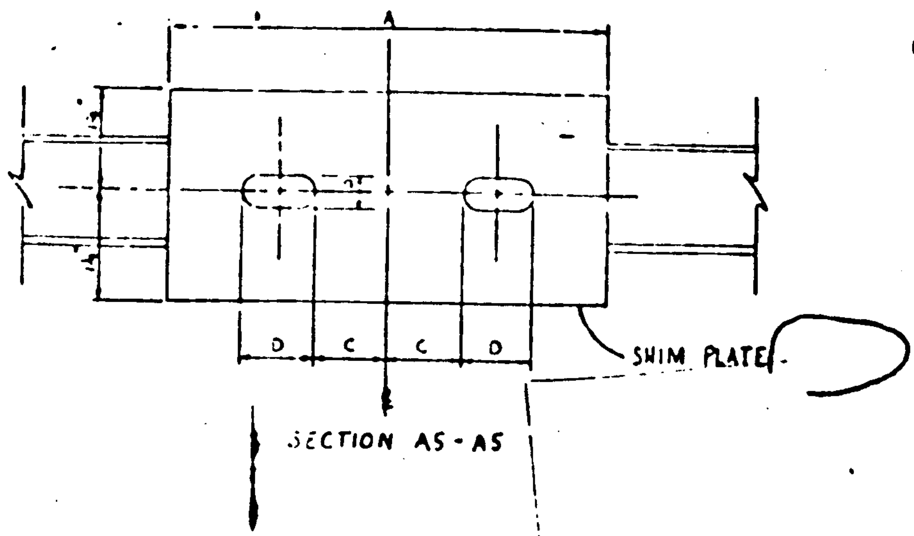
Drawing Nos. 45A0892-X2-5 R3 & -1 R8

Change Complete: [signature] (EN DES Engineer) [signature] (Design Project Manager) JUL 9 1984 (Date)

Closed: Jimmy Childers (Responsible Engineer) 7-30-84 (Date)

Copy 1--Return to CONST by EN DES
Copy 2--Retained by EN DES
Copy 3--Retained by CONST until copy 1 is returned
Distribution to Asst. CONST Supts.

BLN '840801 813



CONDUIT SIZE	CLAMP ITEM #3	SHIM PLATE DIMENSIONS ITEM #2			
		A	B ●	C	D
½"	72558 - 5	4½"	⅜"	¾"	1"
¾"	-7	4½"	⅜"	¾"	1"
1"	-10	4½"	⅜"	¾"	1"
1½"	-15	4½"	⅜"	¾"	1"
2"	-20	7½"	½"	1¼"	1¼"
2½"	-25	7½"	½"	1¼"	1¼"
3"	-30	7½"	½"	1¼"	1¼"
4"	-40	10"	½"	2¼"	1⅜"
5"	-50	10"	½"	2¼"	1⅜"

FOR GENERAL NOTES SEE 4BA0892-X2-1
● MAY BE INCREASED 1/16" AT DISCRETION OF TVA FIELD TO FACILITATE INSTALLATION OF WELDED STUDS.

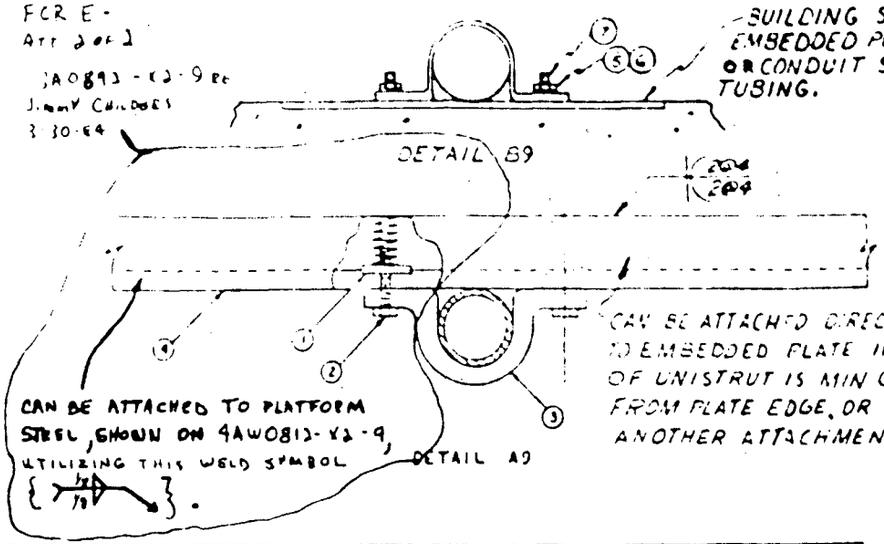
MORE THAN ONE SHIM PLATE MAY BE USED TO REACH REQUIRED THICKNESS UP TO A MAXIMUM THICKNESS OF ½".

FCR E-
ATT 1 of 2
4BA0892-X2-5 R2
Jimmy Childers
3-30-84

2 2692
REVISED PER NCR 2197 FOR DIR E-55
1 2896
ADDED NOTE, PER FCR E-3183

FCR E-
ATT 2 OF 2

4BA0892-X2-9 RE
JIMMY CHILDRES
3-30-84



CONDUIT SIZE	UNISTRUT STRAP	A307 BOLT ⌀	UNISTRUT NUT	WELDING STUD	TORQUE REQUIREMENT FOR WELDED STUD
½"	P2558-5	¼"	P1006-1420	¼"	4 TO 5 FT-LB
¾"	P2558-7	¼"	P1006-1420	¼"	4 TO 5 FT-LB
1"	P2558-10	¼"	P1006-1420	¼"	4 TO 5 FT-LB
1½"	P2558-15	¼"	P1006-1420	¼"	4 TO 5 FT-LB
2"	P2558-20	⅜"	P1008	⅜"	16 TO 17 FT-LB
2½"	P2558-25	⅜"	P1008	⅜"	16 TO 17 FT-LB
3"	P2558-30	⅜"	P1008	⅜"	16 TO 17 FT-LB
4"	P2558-40	⅜"	P1008	⅜"	16 TO 17 FT-LB
5"	P2558-50	⅜"	P1008	⅜"	16 TO 17 FT-LB

ITEM NO.	NO. REQUIRED	MATERIAL DESCRIPTION
1	2	NUT, UNISTRUT P1006-1420 OR P1008 (SEE TABLE)
2	2	BOLT, A307 ¼" OR ⅜" ⌀ (SEE TABLE)
3	1	STRAP, UNISTRUT P2558-5 THRU P2558-50
4	AS REQ'D	UNISTRUT, P1000 SERIES OR P3300 SERIES
5,6	2	ASTM A563 GRADE DH HEX NUT WITH STANDARD WASHER (¾" ⌀ OR
7	2	NELSON STANDARD WELDING STUDS OR EQUAL ¼" ⌀ OR ⅜" ⌀

NOTES:
1. FOR GENERAL NOTES SEE 4BA0892-X2-1.
2. DETAIL B9 MAY BE USED FOR LATERAL AND AXIAL SUPPORT WHEN ATTACHED TO BUILDING STEEL OR EMBEDDED PLATES OR MAY BE SUBSTITED FOR DETAIL A9 FOR ATTACHMENT TO SUPPORTS IN THIS SERIES.

5	SI	8-22-79	REV WELD PER FCR E-2526
4	SI	10-28-85	REVISED WELD PER FCR E-3039
3	SI	4-22-77	REVISED WELD & TABLE AS PER FCR NO'S E-1685 & E-1722
2	SI	12-16-76	REVISED NOTE 2, ITEM 4 & DET A9
1	SI	12-7-77	ADDED DETAIL B9
6	2289		REV TORQUE VALUES PER NCR 2377

DOC

BNP-QCP-10.2, R11
ATTACHMENT A
PAGE 1 of 2

TENNESSEE VALLEY AUTHORITY
FIELD CHANGE REQUEST
REPLY MEMORANDUM

FCR NO E-3508

BLN 840427 579

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

FROM: Lonnie S. C[illegible], Project Manager, Bellefonte Nuclear Plant

DATE: 4-26-84

Attention: Dave Counties / Lou Herbin 840912E0009

O.C.&R. JUL 17 1984 RECEIVED BCW

SECTION I - CONST REQUEST

DCR No. N/A

Reason for change:
(X) Drawing Discrepancy
( ) Facilitate Construction
( ) Additional Design Information

DCU-A SEP 4 1984 REVIEWED BCW

Status Point:
(X) Prior to Fuel Loading
( ) After Fuel Loading But Prior to Closing Capitalized Accou
( ) After Closing Capitalized Accounts for Entire Plant

SUPPORT F/L OF UNIT 2 J.W. 8-27-84
PC III ACT NO. EAEA J.W. 4-25-84
RESP ENGR UNIT EEB-A
RESP ENGR Johnny Whisenant

DESCRIPTION

SEE ATTACHED sheets for changes made to Drawings WLK2 1314-2R9 14-, R9 14-19R9 13-23 R9 14

Structure(s)/System(s) AUX BLDG / EA

Contract No. 75K3-85550

Drawings Affected WLK2 1314-19R913, WLK2 1314-23 R9 14, WLK2 1314-11R9, WLK2 1314-2R9

Marked drawings/sketches required and attached? (X) NO ( ) YES, No. Att's. 2

Change requested by RD Johnny W Whisenant (Responsible Engineer) W L Stork (Unit Supervisor)

Initial EN DES Contact: Lou Herbin (EN DES Engineer) 4-25-84 (Date)

Welding involved: (X) NO ( ) YES, Approved by _____ (WEU Engineer) _____ (Date)

Change approved by: Dave Counties (DPO Engineer) 4-26-84 (Date)

Approval obtained by: (X) Telephone ( ) Memo ( ) Site Rep. ( ) Other

Approved for transmittal to EN DES: W L Stork for E J Vanrich
Asst. Const. E[illegible]r. or Const. Engr. or Project Manager

MEDS WSE

SECTION - EN DES REPLY/RESOLUTION BLP 840709 327

ECN No. 51 Date Issued 6/15/84

Drawing Nos. WLKB17N-7R915(Q) 112915(Q) - 19 PGN(Q), -21 PGN(Q) 7-2-84, GL 7-2-84 CONTAINMENT 75K3-58880 NSB-4

Change Complete: M W. Stevenson (EN DES Engineer) R K Hoole for (Design Project Manager) JUL 9 1984 (Date)

Closed: Johnny W. Whisenant (Responsible Engineer) 8-30-84 (Date)

Copy 1--Return to CONST by EN DES
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Copy 3--Retained by CONST until copy 1 is returned
Distribution to Asst. CONST Supts.

BLN 840905 816

FCR E E-3508

Drawings WUK21314-7R914 and WUK21314-19R913

1. Line NO: 1572 reads from TB31-12 to TB31-32 — SH 142
   Change it to read from TB31-12 to TB31-36

2. Line NO: 1577 reads from TB31-32 to TB72-36 — SH 142
   Change it to read from TB31-32 to TB71-32

3. Line NO: 1581 reads from TB31-48 to TB31-49 — SH 142 Unit
   Change it to read from TB31-48 to TB31-52 — SH 143 Unit

4. Line NO: 1682 reads from TB31-48 to TB71-32 — SH 142 Unit
   Change it to read from TB31-36 to TB72-36 — SH 143 Unit

5. Line NO: 1584 reads from TB31-52 to TB31-53 — SH. 143
   Change it to read from TB31-38 to TB31-53

6. Line NO: 1585 reads from TB31-58 to TB31-59 — SH. 143
   Change it to read from TB31-49 to TB31-32

7. Change repeat lines on sheet 109 to agree
   With line NOs: 1577 AND 1582

FCR E E-3508

Drawings WLK21314-11R914 and WLK21314-23 R914

1. Line No: 1327 reads from TB29-12 to TB29-32 SH. 107
   Change it to read from TB29-12 to TB29-36
2. Line No: 1333 reads from TB29-32 to TB62-36 SH. 107
   Change it to read from TB29-32 to TB61-32
3. Line No: 1337 reads from TB29-48 to TB29-49 SH. 106
   Change it to read from TB29-48 to TB29-52
4. Line No: 1338 reads from TB29-48 to TB61-32 SH 108
   Change it to read from TB29-36 to TB62-36
5. Line No: 1340 reads from TB29-52 to TB29-63 SH 108
   Change it to read from TB29-38 to TB29-53
6. Line No: 1341 reads from TB29-58 to TB29-59 SH. 108
   Change it to read from TB29-49 to TB29-32
7. Change repeat lines on sheet 76 to agree with line Nos. 1333 & 1338

EPA 4.01, 4.02, [illegible] 4.04, 4.25

LOCATION 208 GB-[illegible]

ACTIVITY/ACCOUNT	TASK	SUB PROJ	MISC
NW 2 9 3 9AEPRVW	AD		926

INSTRUCTOR LTM^cCORD

Form to be filled in with appropriate branch/project charge--overhead, working or administrative account.

SWP SECTION E-1

NAME (LAST, FIRST, MI)	S. S. NO.	TITLE SCHED/GRADE	TVA ADDRESS	BR/PR	DATES 7/28/82
DORRIS, JERRY L	411-64-9669	SEC SUPV, M-5	167 GB-K	SWP	✓
STAUB, JAMES E	307-48-5716	SD-4	163 GB	SWP	✓
GRAHAM, ROSS T	[illegible]	[illegible] SD 2	166 GB-K	SWP	✓
BECKNER, JOHN M.	409-92-0058	ELEC. ENG, SD-1	1586 GB-K	SWP	✓
White, A.F.	411-66-5917	ELEC Engr, SD-3	1116 GB-K	SWP	✓
Langley, David	[illegible]	[illegible]	[illegible]	SWP	✓
Benny V. Wilson	409-72-9654	DRAFTSMAN SE-4	1121 GB-K	SWP	✓
Fletcher, Carl W	251-36-9521	Elec Eng SD-1	1118 GB-K	SWP	✓
Holt, [illegible] J.	412-62-9047	Associate SE-6	1119 GB-K	SWP	✓
WALTERS, ROBERT	413-90-1522	AIDE SE-4	157 GB-K	SWP	✓
McCord, Larry T.	407-68-9741	ELEC ENGR SD-3	1117 GB-K	SWP	✓
WEBB, JERRY M.	416-54-3937	ELEC ENGR SD-3	159 GB-K	SWP	✓
WISEHEART, DRAN L.	336-22-2188	SE 6 ASSOC	1113 GB-K	SWP	✓
Perry, STEVEN	415-02-5403	SE-5	156 GB-K	SWP	✓
CRAIG, JOHN S.	415-84-1317	SD-4	160 GB-K	SWP	✓
FOX, MICHAEL H	244-13-1094	SE-5 ASSOC	165 GB-K	SWP	✓
Smith, ADRIAN	[illegible]	[illegible] SD-3	1115 GB-K	SWP	✓
[illegible]	232-60-3294	SE-6	GB-K	SWP	✓

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

NSP 8202220255

TO : Those listed

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

DATE : FEB 2 2 1982 820304F0419 (2)

SUBJECT: ENGINEERING PROCEDURES (EPs) - TRAINING 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:

1. Establish a training program to ensure that individuals are knowledgeable of procedures that govern their work,

2. 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 must 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.

XJAR

0142

Those listed

FEB 26 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.

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.

BC/PM

MO

JRL:ML
cc: G. H. Kimmons, W12A9 C-K
MEDS, 100 UB-K

E22041.26

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 units at Watts Bar.

Resp. Org. [signature] 3/16/84 Task Force Concurrence [signature] 3/9/84

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 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. [signature] 3/16/84 Task Force Concurrence [signature] 3/9/84

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. [signature] 3/16/84 Task Force Concurrence [signature] 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. [signature] 3/16/84 Task Force Concurrence [signature] 3/19/84

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. [signature] 3/16/84 Task Force Concurrence [signature] 3/19/84

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

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.

Resp. Org. DTCliff 1 10184 Task Force Concurrence [signature] 1 10184

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. DTCliff 5 12 83 Task Force Concurrence [signature] 5 15 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 A 24 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. DTCliff 5 12 83 Task Force Concurrence [signature] 5 15 83

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. 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.

Resp. Org. DT Clift 1/3/84 Task Force Concurrence [signature] 1/5/84

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 October 29, 1984 (QMS 841029 200).

Resp. Org. [signature] 11-7-84 Task Force Concurrence [signature] 12/31/84

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. / / Task Force Concurrence / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

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.

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

QMS '841029 200

841031H0324 (6)

TO : Quality Management Staff Files

FROM : J. W. von Weisenstein, 384 SPB-K

DATE : OCT 29 1984

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 Future Work."

J. W. von Weisenstein

JvW:MBP
Attachments
cc: E. [illegible] Beasley W12A21 C-K (Attachments)
L. [illegible] Brock, 396 SPB-K
J. S. Calley, 374 SPB-K (Attachments)
H. L. Jones, W10D22 C K

Principally Prepared By: J. W. von Weisenstein (7706)

10/29/84 - EGB:MBP
cc: Attachments:
R. W. Cantrell, W11A9 C K
EDS, W5B63 K

01840

[redacted]

[redacted]

QUALITY MANAGEMENT STAFF
SURVEILLANCE REPORT FOR THE ASSESSMENT
OF THE EFFECTIVENESS OF CORRECTIVE ACTIONS
IDENTIFIED IN THE TASK FORCE REPORT ON THE
QUALITY ASSURANCE FINDINGS

PLANT: Watts Bar Nuclear Plant Units 1 & 2
CATEGORY: 4

Prepared By: [redacted]
Date: 10-26-88

Approved By: [redacted]
Date: 11-6-88

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 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 is adequate, and the effectiveness of corrective action for future work was also adequate.

III. Details:

A. Performed the following surveillance activities to verify corrective action implementation for completed work:

1. 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 ECNs.

Results: The following ECNs were reviewed, and the following individuals were interviewed:

1. ECN 1973 - Jim Hutson - certain loadings to power train board changed.
2. ECNs 4479 and 4480 - Dennis Lashley - shutdown board room chiller package added.
3. ECN 3798 - Richard Freeman - valve numbers and valves 62-98 and 62-99 changed from closed to open.

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: 4

Prepared By: [signature]
Date: Oct 26, 1984

Approved By: [signature]
Date: 10-26-84

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:

1. 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.

01790

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: 4

Prepared By: D. Anthony Valentine
Date: Oct 26, 1984

Approved By:
Date:

Continued:

2. Verify that input to FSAR revisions is same as actual FSAR content.

   Results: After reviewing ECNs, reviewed amendemnt 52 to the WBN FSAR to verify that revision inputs agreed with the actual content of the FSAR.

3. 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 EN DES-EP 2.01 R6 and will be handled likewise in the future.

4. 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.

5. 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)

01790

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: 4

Prepared By: D. Anthony Vallet
Date: Oct 26, 1984

Approved By: [signature]
Date: 10-26-84

Continued:

V. List of Personnel Contacted:

Name	Title	Organization
Richard Freeman	Nuclear Engineer	NEB
Jim Hutson	Electrical Engineer	EEB
Leo Klaes	Section Supervisor	NEB
Dennis Lashley	Electrical Engineer	EEB
Jim Ritts	Nuclear Engineer	NEB-NLS
Don Williams	Section Supervisor	NEB-NLS
Bill Neely	Section Supervisor	CEB
Joe Little	Section Supervisor	MEB
L. E. Stanford	Section Supervisor	NEB
David Leckie	Electrical Engineer	EEB

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 Plant Units 1 & 2
CATEGORY: 4

Prepared By: L.E. Brock
Date: 9/13/84

Approved By:
Date: 9-17-84

I. Verification of Corrective Action Implementation for Completed Work

Perform the following surveillance activity:

Verify that EN DES-SEP 83-05 (NEB 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 ECN 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 NEB-NLS prior to reporting by EN DES that all ECN work was completed per EP 4.02.

01790

NEB 830818 852

TENNESSEE VALLEY AUTHORITY

Division of Engineering Design

JAR:SRS:MKL - 1984 SPECIAL **ENGINEERING PROCEDURE** 840420E0263 (1)

cc: MEDS-CIS, W5B63 C-K
ESB-PCS, S70 C-K
R. O. Barnett, W9D224 C-K
F. W. Chandler, W8C126 C-K
C. A. Chandley, W7C126 C-K
R. M. Pierce, 104 ESTA-K
J. C. Standifer, 204 GB-K
L. W. Lau, W10D220 C-K
R. C. Weir, W10B120 C-K
D. W. Wilson, W10D224 C-K
J. J. Wilder, W10C136 C-K--Please destroy original SEP 83-05.

EN DES-SEP 83-05

WATTS BAR NUCLEAR PLANT

TITLE: VERIFICATION OF INFORMATION PRESENTED IN FINAL SAFETY ANALYSIS REPORT FOR WATTS BAR NUCLEAR PLANT

ISSUE DATE: August 17, 1983

NEB 840420290

AFFECTS: Engineering Support Branches
Architectural Support Branch
Watts Bar Nuclear Project

"THIS SEP IS NO LONGER NEEDED AND HAS BEEN RETIRED"

John A. Raulston 4/6/84
John A. Raulston Date

	REVISION RO	R1	R2	R3	R4	R5
	DATE 8/17/83					
PREPARED	Vince Bianco					
SPONSORED	John A. Raulston					
REVIEWED	R L Dominguez					
SUBMITTED	M. W. Gantt					
APPROVED	M. J. Burzynski					

TVA 10533 (EN DES-10-79)
MEDS, W5B63 C-K

NEB '830818 852

TENNESSEE VALLEY AUTHORITY

Division of Engineering Design

NEB 8308190251

SPECIAL
ENGINEERING PROCEDURE

EN DES-SEP 83-05

WATTS BAR NUCLEAR PLANT

830825K0187 (17)

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	R1	R2	R3	R4	R5
	DATE 8/17/83					
PREPARED	Vince Bianco					
SPONSORED	John A. Raulston					
REVIEWED						
SUBMITTED						
APPROVED						

TVA 10533 (EN DES-10-79)
WEDS, W5B63 C-K

COORDINATION LOG

Document No.: EN DES-EP 83-05

Title: VERIFICATION OF INFORMATION PRESENTED IN FINAL SAFETY ANALYSIS REPORT FOR WATTS BAR NUCLEAR PLANT

Revision: 0

R–Denotes review

A–Denotes approval

ENGINEERING SUPPORT BRANCHES

CEB		EEB		MEB		NEB		QEB		CEB		NEB			
R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A
	DEO	JDH	DAW		CRE	RKE	RKS			RJH	RJHs	RSM	RSM		
	WBE	CHG	CHG			AEM	AEM			JAE	JAE	LWL	LWL		
NHL	NHL	MWS	MWS			JES	JES								
CPJ	CPJ	MJS	MJS			LJK	LJK					DLW	DLW		
JER	JER	ESB/JG	RKG/JG			DLM	DLM					HLJ	HLJ		
EOS	EOS	AEP	AEP			PCI	PCI								
VGM	TMW	FWC	FWC			RCW	RCW								
NAL CG	NAL LLH														
	RDM														

NUCLEAR PROJECTS DESIGN

BLP		BWP		DNP		IRP		PWP		WBP					
R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A
										JCS					

FOSSIL, HYDRO, & SPECIAL PROJECTS DESIGN AND ARCHITECTURAL SUPPORT BRANCH

CBP		COP		FDP		HDP		SDP		ASB					
R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A
										ABB	ABB				
										JER	JER				
										RMP	RMP				

ESB		MEDS		PBB		OCA									
R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A
FPLG															

EN DES-5/83

EN DES SPECIAL ENGINEERING PROCEDURE (SEP) INDEX

EN DES SEP NO.	REV	DATE ISSUED	TITLE	SPONSOR ORGANIZATION AND PREPARER	AFFECTED ORGANIZATIONS	REMARKS
83-01	0	3-25-83	Browns Ferry Nuclear Plant Instrument Line Inspection Qualification Procedure	CEB K. D. Handy	BWP 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 R. K. Freeman	CEB NEB EEB PBB MEB WBP	
83-03	0		Final Review and Issue of Structures, Systems, and Components List Covered by Quality Assurance Program for Bellefonte Nuclear Plant	NEB D. L. Kitchel	ASB NEB CEB PBB EEB BLP MEB	
83-04	0		Special Contracts Originating Outside EN DES that Require Handling, Processing, and Storage of Engineering Documents by EN DES	NEB A. H. Robeson	ASB MEB BWP NEB CEB EEB	
83-05	0	8-17-83	Verification of Information Presented in Final Safety Analysis Report for Watts Bar Nuclear Plant	NEB S. R. Stout	ASB NEB CEB WBP EEB MEB	
83-06	0		Evaluation of Category I Structures at Bellefonte Nuclear Plant for Seismic Analysis Verification and Distribution of Seismic Design Data	CEB A. B. Savery	CEB BLP EEB MEB NEB	
83-07	0		Sampling Program for Identifying Distress in Pipe, Instrument Lines, and Conduit Caused by Building Settlement at WBN	CEB S. K. Sherfey	CEB WBP	
83-08	0		Identification, Evaluation, and Resolution of Cable Bend Radius Problems at BLN and WBN	EEB C. H. Sudduth	BLP EEB WBP	
83-09	0		Mechanical Equipment Environmental Qualification for Watts Bar Nuclear Plant	MEB T. R. Witmer	EEB MEB NEB WBP	

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VERIFICATION OF INFORMATION PRESENTED IN FINAL SAFETY ANALYSIS REPORT FOR WATTS BAR NUCLEAR PLANT	EN DES-SEP 83-05

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ABBREVIATIONS

10CFR50	- Title 10 of the Code of Federal Regulations, Part 50
EN DES	- Division of Engineering Design
FSAR	- Final Safety Analysis Report
MEDS	- Management and Engineering Data Systems
NEB	- Nuclear Engineering Support Branch
NEB-NLS	- Nuclear Licensing S[illegible]ction (NEB)
NRC	- Nuclear Regulatory [illegible]mission
NSSS	- Nuclear Steam Supply System
OEDC	- Office of Engineering Design and Construction
POWER	- Office of Power
POWER-NLS	- Nuclear Licensing Staff (POWER)
SEP	- Special Engineering Procedure

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VERIFICATION OF INFORMATION PRESENTED IN FINAL SAFETY ANALYSIS REPORT FOR WATTS BAR NUCLEAR PLANT	EN 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 (FSAR), 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 Lead Organization -- The engineering support branch or design project which has primary responsibility for a specific FSAR section as designated in Attachment A.

2.2 Support Organization -- 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 Reviewer — 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 NEB-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 (NEB-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.

NEB-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

1. 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.

c. Any functional descriptions are consistent with the operation of the plant and its equipment.

d. Any physical descriptions accurately describe the current as-designed 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. <u>If all information in an FSAR section is verified as correct,</u> documents this in a memorandum to the Chief Nuclear Engineer.

6b. <u>If corrections are required,</u> 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.

<u>NEB-NLS</u>

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

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

1. 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

2. 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.)

Reviewers

4. Review the draft for conformance to regulatory guides and for technical accuracy; submit any comments to the lead organization.

Lead Organization

5. Resolves all comments; sends their coordinated draft, including drawings and/or figures pertaining to the text, by memorandum to the Chief Nuclear Engineer.

NEB

6. Reviews the draft for licensability, format, completeness, consistency, and licensing commitments.

7. 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.

9. 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.

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

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VERIFICATION OF INFORMATION PRESENTED IN FINAL SAFETY ANALYSIS REPORT FOR WATTS BAR NUCLEAR PLANT

EN DES-SEP 83-05
Attachment A
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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 & 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)	CEB	WBP
3.5 (all)	CEB	WBP, NEB, MEB
3.6 (all)	CEB	NEB, WBP
3.7 (all)	CEB	WBP
3.8.1 - 3.8.5	CEB	WBP
3.8.6	MEB	CEB
Appendix 3.8A thru 3.8D	CEB	
*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 (all)	NEB	Westinghouse
5.1 (all)	NEB	WBP, EEB, Westinghouse
*5.2 (all)	NEB	EEB, WBP, Westinghouse
*5.3.1 - 5.4.3	NEB	Westinghouse
*5.5 (all)	NEB	MEB, EEB, Westinghouse
*5.6 (all)	EEB	Westinghouse
*6.1.1 - 6.1.2	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	EEB	NEB, WBP, Westinghouse
6.4 (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

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6.6 (all)	NEB	MEB
*6.7.18 - 6.7.19	NEB	Westinghouse
6.8 (all)	NEB	WBP
*7.1 - 7.3 (all)	EEB	NEB, Westinghouse
7.4 (all)	EEB	NEB, WBP, MEB, Westinghouse
7.5 (all)	EEB	NEB, WBP, Westinghouse
7.6.1 - 7.6.5	EEB	NEB, WBP, Westinghouse
7.6.6 - 7.6.10	EEB	WBP, NEB, MEB, Westinghouse
7.7 (all)	EEB	NEB, WBP, MEB
Appendix 7A	EEB	WBP
**8.1.1	EEB	
8.1.2 - 8.1.5	EEB	NEB, WBP
**8.2.1.1 - 8.2.1.2	EEB	
**8.2.1.3 - 8.2.2	EEB	NEB, WBP
8.3 (all)	EEB	NEB, WBP, MEB
Appendix 8A thru 8D	EEB	
*9.1.1	NEB	WBP, CEB, Westinghouse
9.1.2	NEB	CEB
*9.1.3 - 9.1.4	NEB	CEB, WBP, Westinghouse
9.2 (all)	MEB	WBP, CEB, NEB
9.3.1	MEB	NEB, WBP, EEB
9.3.2	NEB	WBP
9.3.3	MEB	NEB, WBP
*9.3.4 - 9.3.5	NEB	WBP, Westinghouse
9.3.6	NEB	WBP, EEB
*9.3.7	NEB	WBP, Westinghouse
9.4 (all)	NEB	WBP, MEB
9.5.1	MEB	WBP, EEB, NEB
9.5.2 - 9.5.3	EEB	WBP
9.5.4 - 9.5.8	WBP	MEB, NEB
Chapter 10 (all)	MEB	NEB, WBP, EEB
*11.1.1 - 11.2.10	NEB	Westinghouse
11.3.3 - 11.5.8	NEB	
Appendix 11.A	NEB	
12.1.2	NEB	
12.2.2 - 12.3.2	NEB	
12.3.3	NEB	
12.3.4	NEB	EEB, Westinghouse
12.4 (all)	NEB	
13.4 (all)	NEB	
Chapter 14 (all)	NEB	
*15.1 - 15.4 (all)	NEB	Westinghouse
15.5 - 15.7	NEB	MEB, EEB
Appendix 15A	NEB	

No OEDC review is required for those sections not listed.

*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.

**All or portions of these sections were orignally authored by POWER (TSE&C). Please review these section for accuracy and consistency with other OEDC-prepared material. The accountability exemption noted in section 3.0 applies.

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VERIFICATION OF INFORMATION PRESENTED IN FINAL SAFETY ANALYSIS REPORT FOR WATTS BAR NUCLEAR PLANT

EN DES-SEP 83-05
Attachment B
Page 1 of 1

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)
December 1, 1983	NEB-NLS will coordinate the resolution of any comments on the final draft as needed.

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VERIFICATION OF INFORMATION PRESENTED IN FINAL SAFETY ANALYSIS REPORT FOR WATTS BAR NUCLEAR PLANT

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FOR
EN DES-SEP 83-05

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TENNESSEE VALLEY AUTHORITY

Division of Engineering Design

ENGINEERING PROCEDURE

EN DES-EP 2.01

ALL NUCLEAR PLANTS

840123T0195 (22)

TITLE: SAFETY ANALYSIS REPORTS (AMENDMENTS AND REVISIONS) - PREPARATION, REVIEW, AND APPROVAL

ISSUE DATE: March 4, 1975

AFFECTS: Engineering Support Branches
Architectural Support Branch
Nuclear Projects Design
Special Design Projects
Engineering Services Branch

OTHERS NAMED FOR INFORMATION ONLY: Office of Power, Nuclear Licensing Staff

REVISION RO	R1	R2	R3	R4	R5
DATE 3-4-75	7-6-78	5-25-79	3-3-80	5-17-82	12-29-83
PREPARED	John A. Raulston				
SPONSORED	Dwight R. Patterson				
REVIEWED					
SUBMITTED	I. L. Burroughs				
APPROVED	Don B. Weaver				

TVA 10633 (EN DES-3-77) * Names in typescript denote RO signatures.

COORDINATION LOG

Document No.: EN DES-EP 2.01

Title: SAFETY ANALYSIS REPORTS (AMENDMENTS AND REVISIONS) - PREPARATION, REVIEW, AND APPROVAL

Revision: R5

R–Denotes review

A–Denotes approval

ENGINEERING SUPPORT BRANCHES

CEB		EEB		MEB		NEB		QEB							
R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A
EDS				CEB											

NUCLEAR PROJECTS DESIGN

BLP		BWP		DNP		IRP		PWP		WBP					
R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A

FOSSIL, HYDRO, & SPECIAL PROJECTS DESIGN AND ARCHITECTURAL SUPPORT BRANCH

CBP		COP		FDP		HDP		SDP		ASB					
R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A

ESB		MEDS		PBB		OQA									
R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A

EN DES–5/83

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Title: SAFETY ANALYSIS REPORTS (AMENDMENTS AND REVISIONS) - PREPARATION, REVIEW, AND APPROVAL	REVISION LOG EN DES-EP 2.01

Revision No.	DESCRIPTION OF REVISION	Date 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

TABLE OF CONTENTS

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

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SAFETY ANALYSIS REPORTS (AMENDMENTS AND REVISIONS) - PREPARATION, REVIEW, AND APPROVAL	EN DES-EP 2.01

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 post-operating 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 (10CFR50). 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.

3.0 DEFINITIONS (Continued)

3.3 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.

3.4 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.

3.6 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).

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 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.

4.0 PREPARATION, REVIEW, AND APPROVAL OF SAFETY ANALYSIS REPORTS

4.1 SAR Preparation and Review Schedule (PRS)

NEB (Nuclear Licensing Section)

1. 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.

2. 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).

3. 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

1. 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.

   b. FSAR Drafts--Reflect in detail the final design and incorporate responses to PSAR questions in the text.

   c. UFSARs--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.

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.

2. 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.

3. 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

6. 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)

7. Reviews the internal draft for licensability, format, completeness, consistency, and licensing commitments.

8. Processes any licensing commitments in accordance with EN DES-EP 2.07.

9. 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.

10. 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

12. Signs the transmittal memo which constitutes OEDC approval of final draft SAR material and/or comments.

NEB (Nuclear Licensing Section)

13. 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

NEB (Nuclear Licensing Section)

1. 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.

2. 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

3. Review external drafts for technical accuracy and conformance to regulatory guidance; send their comments to NEB-NLS.

NEB (Nuclear Licensing Section)

4. Reviews the drafts for licensability, format, completeness, and consistency.

5. Coordinates and compiles all comments on 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

7. Signs the transmittal memo which constitutes OEDC approval of SAR material and/or comments.

4.4 Records of SAR Preparation

Preparing Organizations

1. 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.

2. 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)

1. Keeps records documenting internal and external OEDC preparation and review of SAR material.

2. Keeps records documenting that the preparing organizations prepared or reviewed amendment material.

3. Keeps records showing that OEDC comments on non-OEDC-prepared material were sent to POWER's Nuclear Licensing Staff or were otherwise resolved.

4. 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)

1. Formally conducts a survey of OEDC to determine the number of copies of PSARs, FSARs, and UFSARs needed in OEDC.

2. Informs POWER's Nuclear Licensing Staff of the number of copies required by OEDC.

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)

3. Receives from POWER's Nuclear Licensing Staff copies of PSARs, FSARs, and UFSARs as they are issued to the NRC.

4. Sends the distribution list and the copies of SAR material to the Engineering Services Branch (ESB), Procedures Control Section.

ESB (Procedures Control Section)

5. 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

6. File the SAR material upon receipt and sends the signed and dated return receipt to ESB's Document Control Center.

ESB (Procedures Control Section)

7. 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. Resolution 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)

1. After receiving formal or draft NRC information requests or position statements, prepares a draft PRS.

2. 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.

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)

4. 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 submittal date.

5.1.2 Revisions to PSARs and FSARs Initiated by OEDC

Preparing Organizations

1. 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.

2. 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)

3. Verifies and/or coordinates the need for proposed PSAR/FSAR revisions and notifies POWER's Nuclear Licensing Staff.

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.

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

1. 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.

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.

3. 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.

4. 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)

1. Reviews revisions proposed by OEDC personnel (see 3a. and 3b. below).

2. 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.

5.0 PREPARATION, REVIEW, AND APPROVAL OF AMENDMENTS AND REVISIONS (Continued)

5.2.6 Check on Proper Drawing Revisions

NEB (Nuclear Licensing Section)

1. 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.

2. Periodically receives from the Planning and Budget Branch (PBB) a computer listing of the status of all TVA figures on each specific plant.

3. 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.

   NOTE

   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.

5. 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)

1. 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)

Preparing Organization and NEB (Nuclear Licensing Section)

2. 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

3. 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.

5. Sends the revised "as constructed" drawings to the design project.

Design Project

6. 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.

9. 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.

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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TVA

TENNESSEE VALLEY AUTHORITY

Division of Engineering Design

THIS SHEET MAY BE DISCARDED ONE YEAR AFTER THE R5 DATE.

ENGINEERING PROCEDURE

✓ **EN DES-EP** 2.04

NUCLEAR PROJECTS

840123T0193

(2)

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.

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Architectural Support Branch
Nuclear Projects Design
Special Design Projects
Engineering Services Branch

	REVISION RO	R1	R2	R3	R4	R5
	DATE 5-16-74	3-21-75	7-6-78	3-3-80	5-17-82	12-29-83
PREPARED	*William H. Kelley	S.A.T.				
SPONSORED	Dwight R. Patterson	D.R.P				
REVIEWED						
SUBMITTED	I. L. Burroughs	I.L.B.				
APPROVED	Roy H. Dunham	R.H.D.				

MEDS USER SVC CTR
W7A60 C-K

TVA 10533 (EN DES-3-77) *Typed names and initials denote RO and R1 signatures.

TVA

Title: AMENDMENTS TO SAFETY ANALYSIS REPORTS - PREPARATION, REVIEW, AND APPROVAL

REVISION LOG

EN DES-EP 2.04

Revision No	DESCRIPTION OF REVISION	Date Approved
5	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.	12-29-83

TVA

TENNESSEE VALLEY AUTHORITY

Division of Engineering Design

ENGINEERING PROCEDURE

THIS SHEET MAY BE DISCARDED ONE YEAR AFTER THE R1 DATE.

EN DES-EP 2.05

ALL NUCLEAR PLANTS

(2)

TITLE: MAINTENANCE OF FINAL SAFETY ANALYSIS 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				
PREPARED	*EGB *Stuart Thickman	RTH WK				
SPONSORED	*John A. Raulston/ *DRP	JAR/HW				
REVIEWED		**				
SUBMITTED	*P. L. Duncan *DBW for ILB					
APPROVED	*D. B. Weaver					

*Original signed by ** Reviewed by PLD

TVA

Title: MAINTENANCE OF FINAL SAFETY ANALYSIS REPORTS IN A CURRENT STATUS

REVISION LOG

EN DES-EP 2.05

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TVA

TENNESSEE VALLEY AUTHORITY

Division of Engineering Design

840823T0176 (40)

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: ~~Nuclear 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.

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PREPARED	E. A. Phillips*	**				
SPONSORED	J. W. Wilson*	JWW				
REVIEWED	P. L. Duncan*	PLD				
SUBMITTED	I. L. Burroughs*	ILB				
APPROVED	Roy H. Dunham*	RHD				

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*Indicates RO signatures; R1-R15 initialed cover pages are in PP history file.

TVA

Title: ENGINEERING CHANGE NOTICES (ECNs) BEFORE LICENSING - HANDLING

REVISION LOG

EN DES-EP 4.02

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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.	7-23-84

COORDINATION LOG

Document No.: EN DES-EP 4.02

Title: Engineering Change Notices (ECNs) Before Licensing - Handling

Revision: 16

R–Denotes review

A–Denotes approval

ENGINEERING SUPPORT BRANCHES

CEB		EEB		MEB		NEB		QEB							
R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A

NUCLEAR PROJECTS DESIGN

BLP		BWP		DNP		IRP		PWP		WBP					
R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A

FOSSIL, HYDRO, & SPECIAL PROJECTS DESIGN AND ARCHITECTURAL SUPPORT BRANCH

CBP		COP		FDP		HDP		SDP		ASB					
R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A

ESB		MEDS		PBB		OQA									
R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A
						WET	WET								

EN DES–5/83

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LIST OF ILLUSTRATIONS

ABBREVIATIONS

CIS	- Computer Indexed System
CONST	- Division of Construction
DCD	- Design Criteria Diagram
DCR	- Design Change Request
ECN	- Engineering Change Notice
EN DES	- Division of Engineering Design
FCR	- Field Change Request
FSAR	- Final Safety Analysis Report
ID-QAP	- Interdivisional Quality Assurance Procedure
IJ	- Impact Justification
L-ECN	- ECN Issued After Licensing
MEDS	- Management and Engineering Data Systems
NCR	- Nonconformance Report
~~NPD~~	~~- Nuclear Projects Design~~
NRC	- Nuclear Regulatory Commission
NUC PR	- Division of Nuclear Power
OL	- Operating License
OWIL	- Outstanding Work Items List
P-ECN	- ECN Issued After Construction Project Manager Leaves Site
QA	- Quality Assurance
SAR	- Safety Analysis Report
SDP	- Special Design Projects
USQD	- Unreviewed Safety Question Determination

TVA

ENGINEERING CHANGE NOTICES (ECNs) BEFORE LICENSING - HANDLING	EN DES-EP 4.02

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 engineering 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 S1 (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.

If the proposed change is identified by a ~~support~~ discipline branch or SDP and an IJ analysis is not required, the ~~support~~ discipline branch or SDP notifies ~~a. Sends to~~ the discipline NPB project engineer a memo providing information (~~with attachments~~ 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.

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 issuance of a design criteria document (or revision) or a Design Input Memo as in EN DES-EP 3.01.~~

discipline engineer directs the initiator to

~~1.~~ If the standard ECN S1 does not apply (see subsection 4.6), ~~recommends in the memo that~~ the ~~NPD~~ project prepare an ECN cover sheet (Figure 1) and attachments 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 will expedite preparation of the cover sheet.~~

engineer(s)

The initiator of the proposed change will coordinate with the discipline ~~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.[1]

4.1.2 Cover Sheet

~~NPD Project~~ Initiator

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, ~~assigns~~ obtains an ECN number, and indicates whether an IJ analysis was required (see Figure 1). from the project management staff

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[1] ~~1~~ 2. 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)

Initiator
~~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

When a ~~support~~ discipline branch or SDP identifies a proposed design change ~~by a memo~~, the ~~NPD~~ design manager project will provide ~~an early~~ a response by either disapproving the change or ~~completing~~ directing completion of 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 design project manager.

2. Determines which ~~support~~ discipline branches and ~~NPD~~ design 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

If a ~~support~~ discipline 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), ~~support~~ discipline determines which 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~~ discipline branches. (Prior approval of sketches by the ~~support~~ discipline branch or project may be needed to expedite the ~~support~~ discipline branch review.)

5. Names any applicable vendor(s) at VENDOR(S) INVOLVED; makes all YES-NO marks called for by the cover sheet.

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2 3. When a ~~support~~ discipline branch concurrence indicates the change is required, and with the approval of the appropriate ~~NPD~~ design project manager, the ECN may be prepared while the IJ forms are being completed (ref. EN DES-EP 4.40).

4.0 ECN BEFORE ISSUANCE OF OPERATING LICENSE (Continued)

4.1.2 Cover Sheet (Continued)

Initiator
~~NPD 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 ~~NPD~~ design project manager.

Design
~~NPD~~ Project Manager

8a. For an ECN not requiring other discipline ~~a support~~ branch approval, continues with step 12.

8b. For an ECN requiring other discipline ~~a support~~ branch approval, signs on approval at "ECN IS READY FOR ~~ENG~~ DISCIPLINE BRANCH REVIEW." (Go to step 9.)

NOTE

As a minimum, approval of the ECN by another discipline ~~a support~~ branch(es) 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.

~~NPD Project (ECN Clerk)~~

9. Forwards the ECN to the reviewing discipline ~~support~~ branch(es).

Discipline
Reviewing ~~Support~~ Branch(es)

10. Reviews the ECN. (Safety Review/Technical Review)

NOTE

The expected (normal) review time for any discipline branch ~~support~~ review ~~branch~~ is within seven workdays after receiving the ~~review~~ package.

11. On approval, signs at Approved; returns the cover sheet to the ~~NPD~~ project, management staff.

the discipline branch chief(s) or his designee(s)

4.0 ECN BEFORE ISSUANCE OF OPERATING LICENSE (Continued)

4.1.2 Cover Sheet (Continued)

Design ~~NPD~~ Project Manager

12. Reviews the ECN; signs at RELEASED if he approves. (See ~~NPD~~ project manager's approvals at item c in Figure 2.)

~~NPD~~ Project ~~(ECN Clerk)~~ Management Staff

13. 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

19. 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

1. 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)

2. 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.

3. If an FSAR has been submitted to the NRC, lists any FSAR text revisions on the back of the data sheet.

4. 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 ~~NPD~~ ~~ECN clerk.)~~ management staff.)

5. Records in the prescribed block the number of pages of the initial issue (R0) of the data sheet.

6. If the data sheet is by a ~~support~~ discipline branch or SDP:

   a. Gets the data sheet reviewed and approved through Branch Chief/SDP Manager.

   b. Sends the data sheet to the ~~NPD~~ design project manager within 15 workdays after the ~~NPD~~ design 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 a ~~NPD~~ design project group:

   a. Gets the data sheet reviewed and approved through ~~Group Head.~~ Project Engineer/Discipline Group Head.

   b. Forwards the data sheet to the ~~NPD~~ design project manager ~~ECN clerk~~ within 15 workdays after the ~~NPD~~ design project manager releases the cover sheet.

~~NPD~~ Project ~~(ECN Clerk)~~ Management Staff

8. 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

Data sheets for a given ECN are numbered consecutively. If an additional section in a ~~support~~ discipline branch becomes involved after initial numbering, its data sheet gets the next unused number.

9. Gets a MEDS accession number stamped on the data sheet.

10. Obtains the ~~NPD~~ design project manager's review and release signature; distributes copies to those listed on Figure 5, and others as necessary, within 10 workdays after the ~~NPD~~ design 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 all 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 discipline ~~support~~ branch submitting data sheets, and any involved discipline ~~support~~ branch chief. SDP

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) (~~NPD~~ design 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.

b. 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 ~~ECN clerk~~ management staff 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.

4.0 ECN BEFORE ISSUANCE OF OPERATING LICENSE (Continued)

4.3.3 Handling Change to ~~NPD Project~~ Data Sheet (Except SDP)

Engineering or Design ~~NPD~~ Section Supporting ECN

1. Ensures that the data sheet original is revised as necessary; observes the restrictions in subsections 4.3.1 and 4.3.2.

~~NPD Project~~

2. Reviews and, on approval, obtains initials on the data sheet through Project Engineer ~~(Group Head)~~ / Discipline Group Head.

Design ~~NPD~~ Project Manager (or His Delegate)

3. 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 Branch~~/SDP Data Sheet

Preparer

1. Marks the ~~support 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

2. Reviews and, on approval, initials the approval matrix through ~~Branch Chief~~/SDP Manager.

3. Forwards the marked and approved copy of the data sheet to the ~~NPD~~ project / management staff.

~~NPD~~ Project ~~(ECN Clerk)~~ Management Staff

4. Transfers all change marks (including ~~support branch or~~ 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 Branch~~/SDP Data Sheet (Continued)

~~NPD~~ Project ~~(ECN Clerk)~~ (Continued)

5. At the project's option, discards or retains ~~the support branch's or~~ SDP's marked copy.

~~NPD Project Manager (or His Delegate)~~

6. Reviews and, on approval, obtains the project manager's initials on the signout matrix of the original data sheet.

~~NPD Project (ECN Clerk)~~

7. 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:

1. 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~~ discipline branches who reviewed and approved the ECN and requests technical comments on the plans to void the ECN.
3. If there are no safety or technical reasons why the ECN cannot be voided, ~~the NPD project~~:
   a. Marks the cover sheet "VOID" in bold letters across the SCOPE.
   b. Gets any necessary dated coordinating initials from the involved ~~project groups and/or support~~ discipline branches.
   c. Obtains the ~~NPD~~ design project manager's approval initials.
   d. Distributes copies (include MEDS CIS).
   e. Files the original voided cover sheet.

4.0 ECN BEFORE ISSUANCE OF OPERATING LICENSE (Continued)

4.4 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.

4.5 Closing Design Work for ECN (See Figure 8.)

When ~~NPD~~ design project records (plus any needed project management staff inquiry among involved ~~support~~ discipline 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 ~~support~~ discipline branch 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 chiefs of the support branches, the project manager of SDP, and the NPD project group heads~~ responsible persons within the organization that submitted data sheets for the ECN(s) being closed.

The ~~NPD~~ management staff project numbers the closure design 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.

b. 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.[3]

An ECN S1 change may be used only for minor changes and when:

a. The change involves only one ~~NPD~~ section,[4] ~~or one SDP section, or one support branch section~~[5], or

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3 4. Refer to the EN DES Project Control User's Manual.

4 5. 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 under the same discipline project engineer: ~~within the same group in the design project:~~ (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 ~~support~~ discipline branch not involved in the design, or

c. The change is to a conceptual document generated in a ~~support~~ discipline branch for one of the following purposes:

(1) A change to make very minor editorial corrections, such as spelling, or

(2) 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:

a. 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,[5] (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,[6] or

c. The change would require physical work by CONST after a date agreed to by the ~~NPD~~ design project manager and the CONST project manager or after the issuance of the OL, or

d. 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

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[5] 5. Vendor drawings turned over to TVA for revision responsibility are treated as TVA drawings.

[6] 6. See footnote 4.

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 S1.~~

4.6.4 Monthly Review of ECN S1 Changes

Each design project manager shall provide to the ~~support~~ discipline 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 Submittal 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.[7] The ECN is initiated as in subsection 4.1.1.

Any ECN issued after receipt of the OL is handled as an L-ECN or a P-ECN (ref. EN DES-EP 4.52).

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7. In some cases, the ~~NPD~~ design 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~~ design 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.

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

1. Reviews the Outstanding Work Items List (OWIL)[8] to ensure that all ECNs not completed by EN DES before the OL is issued are included.

2. 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

3. 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 ~~NPD~~ project with a reproducible copy. design

[8] 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 handling 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)

Design
~~NPD~~ Project

4. 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. _____."

5. Stamps the reissued ECN cover sheet and the R0 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 design 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 ~~support~~ discipline branch(es) conceptual documents is coordinated with the ~~support~~ discipline branch(es) and documented by the ~~support~~ discipline branch or ~~NPD~~ design 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 the ~~NPD~~ design project.

6.2 Major Additions

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 ~~NPD~~ design 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 estabished 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 3.03, Seismic 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~~

7.0 REFERENCES (Continued)

7.12 EN DES-EP 4.40, ~~Engineering Change and Handling~~ Impact Justification & Analysis

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~~ Responsibility for the Plant from 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

7.18 ID-QAP-2.4, ~~Future~~ Control of Modifications

~~7.19 ID-QAP-6.2, Preparation, Maintenance, and Distribution of the Outstanding Work Items List (OWIL)~~

TVA 10575C (EN DES-5.63)

ENGINEERING CHANGE NOTICE COVER SHEET

(BEFORE ISSUANCE OF OPERATING LICENSE)

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ECN No. (a) _____

TO: Construction Project Manager _____

From: NPD Project Manager _____

DATE _____

Was IJ Analysis Required: Yes (b) ____ No ____

Prepared by	Section	Section Leader
Project Engineer	Released: (c) NPD Project Manager	Date

SCOPE

Project _____ Affected Unit(s) (d) _____

System or Feature _____

Reference & Description of Change (e) _____

DRAWINGS OR B/M'S INVOLVED: (Data Sheets Required)	Yes or No	Date Data Sheet Available
CIVIL ENGR SUPPORT BRANCH	(f)	(g)
ELEC ENGR SUPPORT BRANCH		
MECH ENGR SUPPORT BRANCH		
NUCLEAR ENGR SUPPORT BRANCH		
ARCH. SUPPORT BRANCH		
SPECIAL DESIGN PROJECTS		
NUCLEAR PROJECTS DESIGN GROUPS		
Civil		
Electrical		
Mechanical		

SUPPORT BRANCHES APPROVAL REQUIRED	Yes or No (h)
ECN is ready for support branch review:	
NPD Project Manager	Date
Approved: (i)	
Civil Support Br. Chief	Date
Electrical Support Br. Chief	Date
Mechanical Support Br. Chief	Date
Chief Nuclear Engineer	Date
Arch. Support Br. Chief	Date

PHYSICAL WORK MUST BE DONE BEFORE: (k)	Pre-Op Test	1st Fuel Load	(l)
Unit(s) _____			
Unit(s) _____			

	Yes or No (j)
Required for PSAR or FSAR	
Required for Preoperational Test: (h)	
If Yes, Test No. _____	
Vendor Backcharges Involved (i)	
Seismic Analysis Required (m)	
Nonconformance Report Required (n)	
QA Applies (o)	
Security System Modified (p)	
Human Factor Review Required (q)	
Pipe Rupture Analysis Required (r)	
Vendor(s) involved _____	

cc (Attachments): No · Yes ( ) (u)

NOTES: ~~1. NPD project is 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)

TVA

ENGINEERING CHANGE NOTICES (ECNs) BEFORE LICENSING - HANDLING	EN DES-EP 4.02

KEY

a. By the ~~NPD~~ design 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 ~~NPD~~ design project, ~~support~~ discipline 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~~ design project manager includes ~~approval of: (1)~~ : (1) approval by discipline branches of the change, based on the design criteria, SAR, and/or other controlling documents, and the information on the cover sheet (scope of review, physical work that must be completed by, etc.); and (2) his approval of costs and changes to the schedules for design and construction so that design and procurement work may 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 ~~support~~ discipline 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 ~~support~~ discipline branch having procurement action only.

Figure 2. Key and Distribution List for Figure 1 (Sheet 1 of 3)

g. Data sheets are due from every involved ~~support~~ branch/~~NPD project group~~/SDP within 15 workdays after the ~~NPD~~ project manager releases the cover sheet. Record a date here only if the ~~support~~ 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 ~~support~~ 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.

l. "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 safety-related 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)

o. "Yes" if the ECN is safety-related. If the ECN involves a limited QA 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

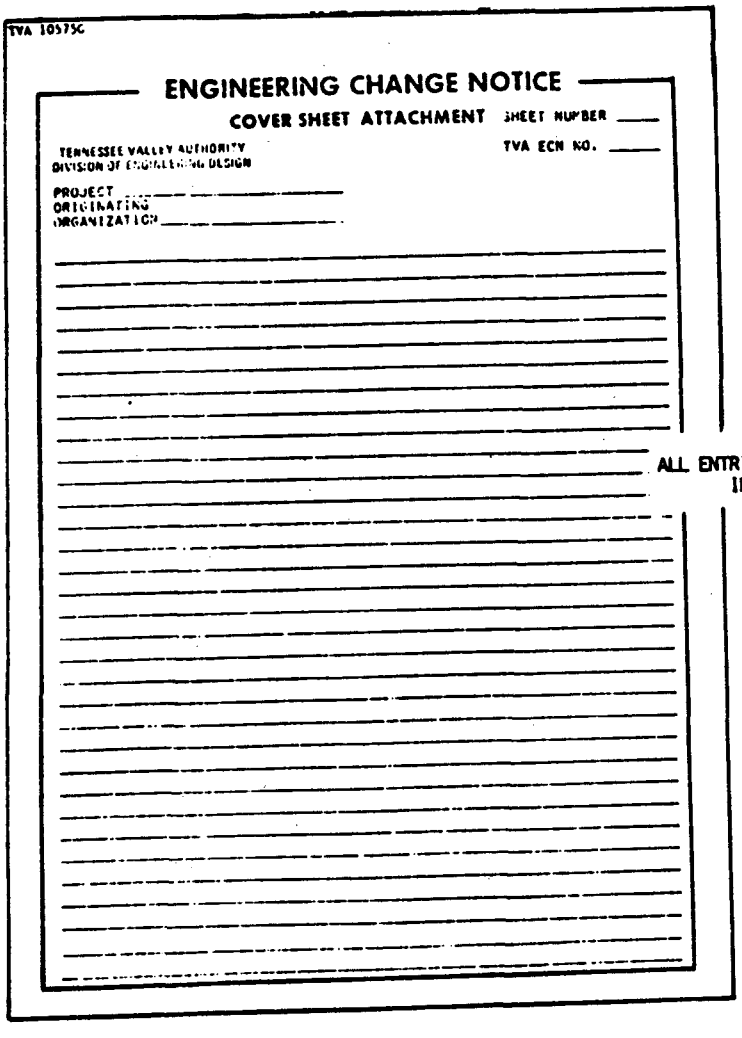
ECN cover sheets are distributed as follows:

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)


TVA 10575C

ENGINEERING CHANGE NOTICE

COVER SHEET ATTACHMENT SHEET NUMBER ____

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

TVA ECN NO. ____

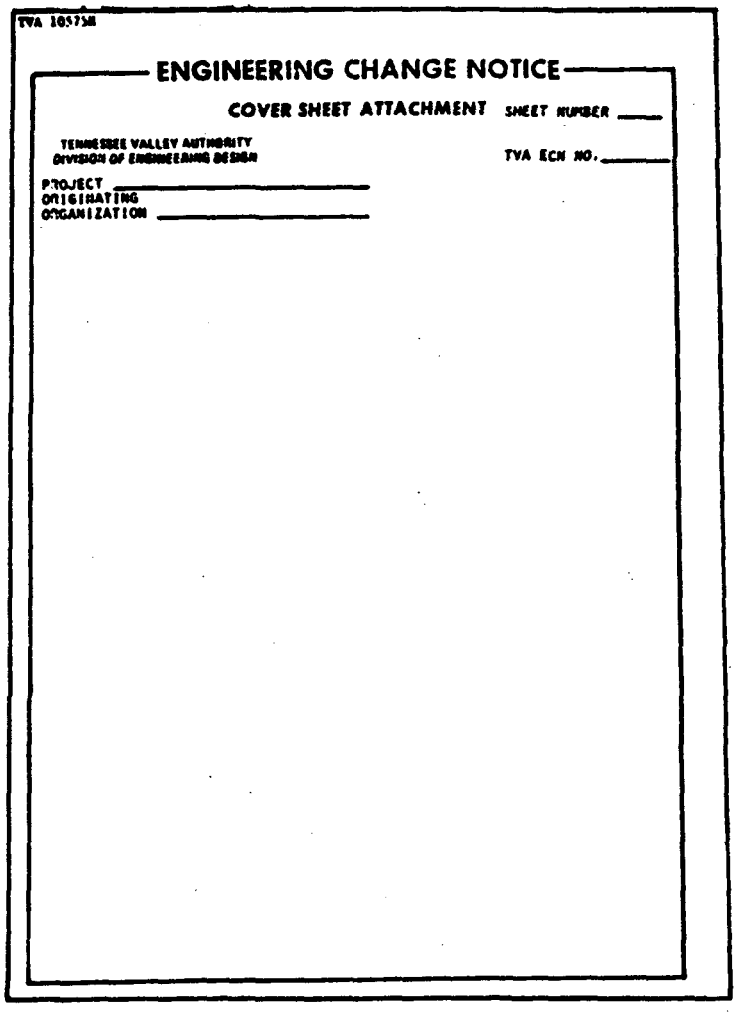
PROJECT ____
ORIGINATING ORGANIZATION ____

~~• NPD Project is responsible for all entries.~~

• This sheet is for text supporting the ECN Cover Sheet's Scope section.

ALL ENTRIES AND SIGNATURES IN BLACK INK

Figure 3. ECN Cover Sheet Attachment for Text, Form TVA 10575G



TVA 10575H

ENGINEERING CHANGE NOTICE

COVER SHEET ATTACHMENT SHEET NUMBER ____

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

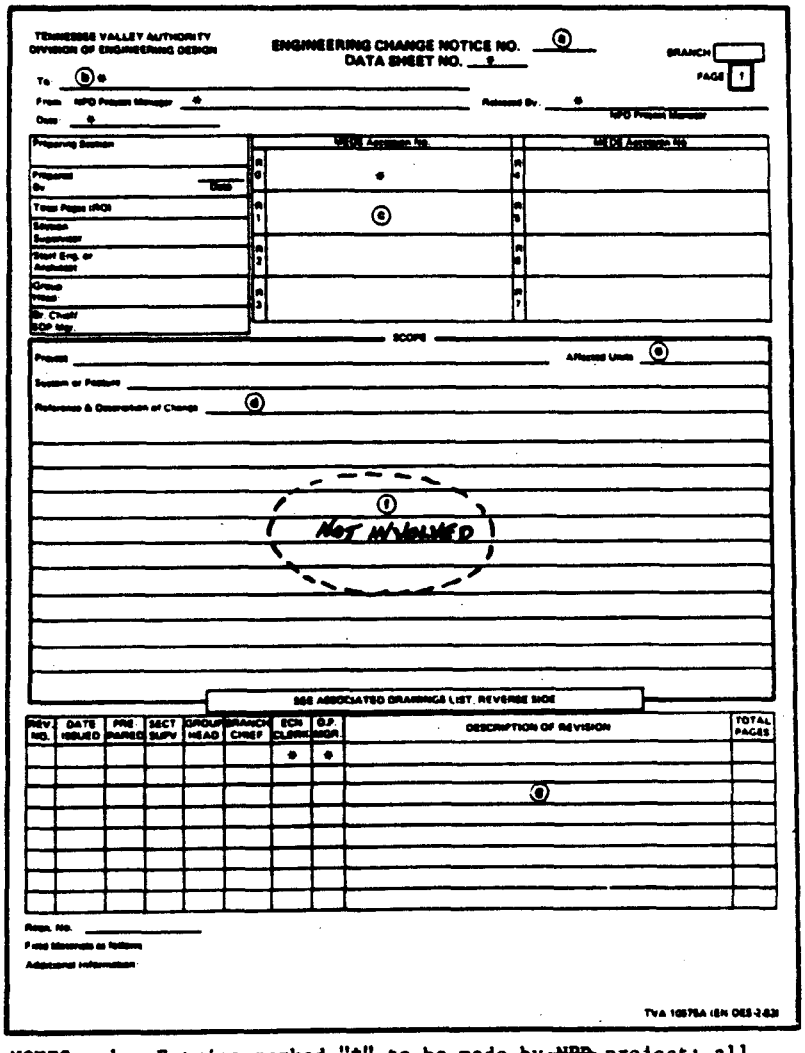
TVA ECN NO. _____

PROJECT _____
ORIGINATING
ORGANIZATION _____

~~• NPD Project is responsible for all entries.~~

• This sheet is for graphics supporting the ECN Cover Sheet's SCOPE section.

Figure 4. ECN Cover Sheet Attachment for Graphics, Form TVA 10575H


TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

ENGINEERING CHANGE NOTICE NO. ⑥
DATA SHEET NO. 2

BRANCH
PAGE 1

To ⑤ *

From NPD Project Manager *

Released By * NPD Project Manager

Date *

Preparing Section	NEDB Accession No.	NEDB Accession No.
Prepared By / Date	30 * 40	
Team Piper NPD	31 ⑥ 41	
Section Supervisor	32 42	
Project Eng. or Assistant	33 43	
Group Head	34 44	
Br. Chief SQC Mgr.	35 45	

SCOPE

Project _____ Affected Units ⑥

System or Feature _____

Reference & Description of Change ⑥

⑦ NOT INVOLVED

SEE ASSOCIATED DRAWINGS LIST, REVERSE SIDE

REV. NO.	DATE ISSUED	PRE PARED	SECT SUPV	GROUP HEAD	BRANCH CHIEF	ECN CLERK	E.P. ENGR	DESCRIPTION OF REVISION	TOTAL PAGES
						*	*		
								⑧	

Resp. No. _____

Field Measures as follows

Additional Information

TVA 10575A (EN DES-2-83)

NOTES: 1. Entries marked "*" to be made by ~~NPD~~ project; all other entries by preparing organization. management staff
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)

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 R0 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 ECN effects a change to only one unit, indicate "1" or "2;" if the change applies to both units, show "1 and 2."

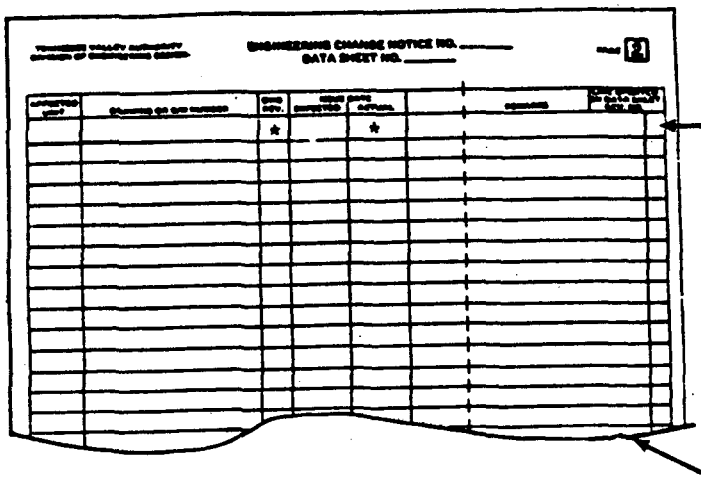
f. If the ECN originator shows on the cover sheet that your branch~~/project group~~ is involved, prepare a data sheet. If your branch~~/project group~~ determines that they are not involved, print NOT INVOLVED as shown.

g. Complete the signout and description block for the appropriate *revision*.

DISTRIBUTION (Minimum; others as necessary)

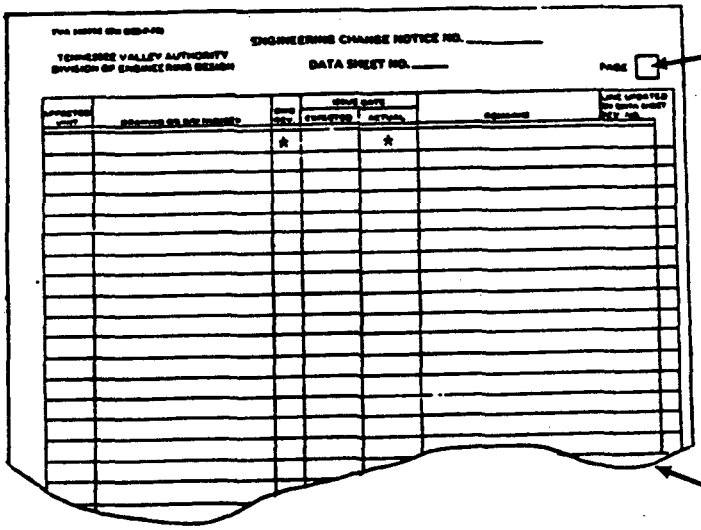
Originating Section
Plant Superintendent
MEDS, W5B63 C-K

Figure 5. ECN Data Sheet, Form TVA 10575A (Front Side - Key and Distribution) (Sheet 2 of 2)



When adding, deleting, or changing information about a drawing, show associated Data Sheet revision number here.

Reverse side of TVA 10575A

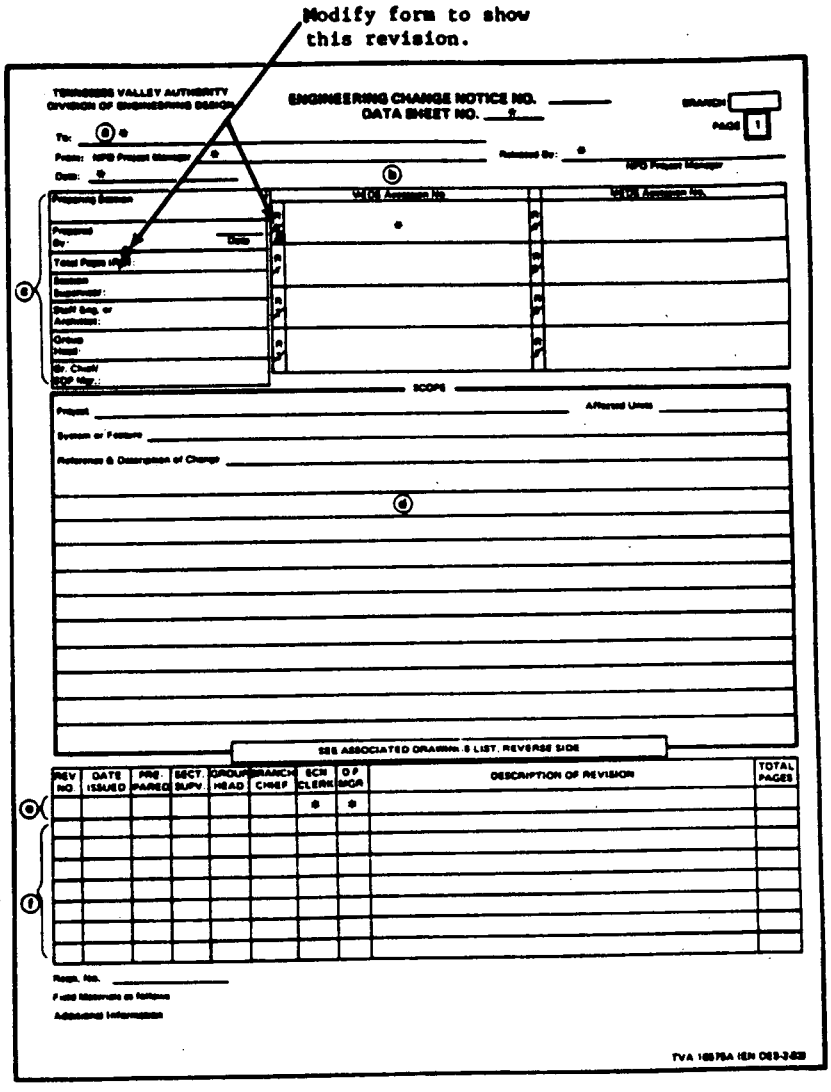


For sheets 3, 4, 5, etc., use TVA form 10575E.

TVA 10575E

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 ~~NPB~~ project; all other entries by preparing organization. — management staff
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)

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).

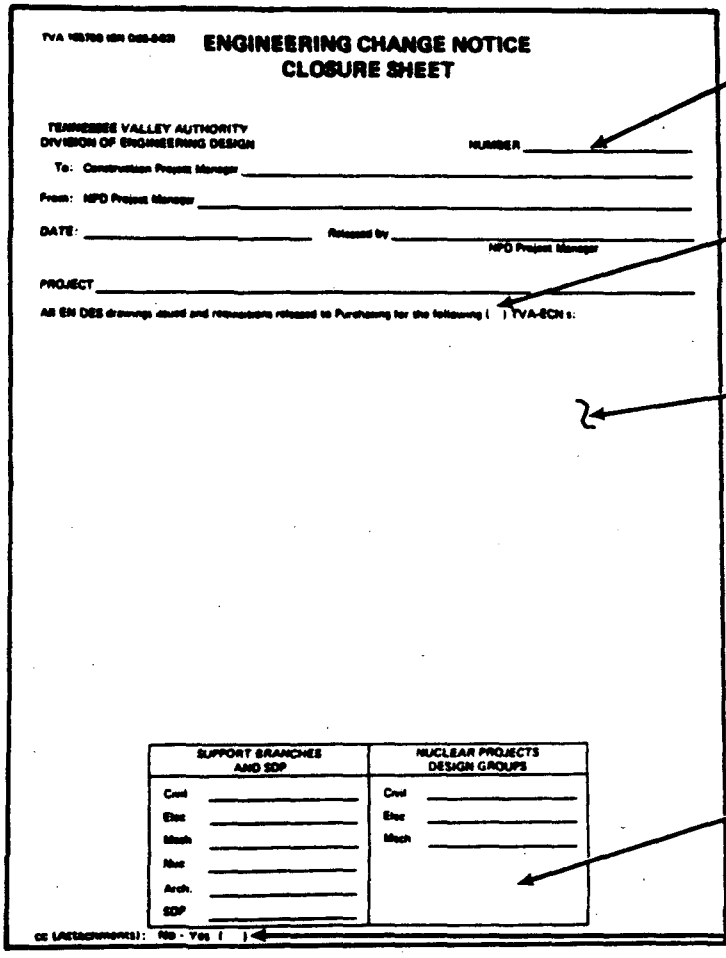
e. Show the revision with approvals and description here.

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)



TVA 10575B (EN DES-EP)

ENGINEERING CHANGE NOTICE CLOSURE SHEET

TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

NUMBER _____

To: Construction Project Manager _____

From: NPD Project Manager _____

DATE: _____ Released by _____
NPD Project Manager

PROJECT _____

All EN DES drawings issued and revisions released to Purchasing for the following ( ) TVA-ECN s:

SUPPORT BRANCHES AND SDP		NUCLEAR PROJECTS DESIGN GROUPS	
Civil		Civil	
Elec		Elec	
Mech		Mech	
Nuc			
Arch.			
SDP			

cc (ATTACHMENTS): No - Yes ( )

Each project numbers their closure sheets 1, 2, 3 . . . n.

Quantity of ECNs being closed out.

Corrections may be made by lining through in ink, and must be signed and dated by the person responsible for reviewing or approving the change.

NOTE

After issue, a closure sheet may not be revised or voided.

Only the ~~support~~ discipline branches or SDP ~~, or NPD project groups~~ that submitted Data Sheets are required to initial.

Denotes the number of attachments (memos sketches, etc.) other than Data Sheets.

NOTES: 1. ~~NPD~~ The management staff project is responsible for all entries.
2. All entries and signatures to be made in black ink.

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
Chief, Special Design Projects
Manager of Construction
Chief, Cost Planning and Control Staff
MEDS, W5B63 C-K

Figure 8. ECN Closure Sheet, Form TVA 10575B

TVA Task Force for
Review of Black &
Veatch Findings

EVALUATION SHEET

Rev. R2
Date 12/27/83

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. M R Belew 1/9/84 Task Force Concurrence [signature] 1/9/84

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 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. M R Belew 1/9/84 Task Force Concurrence [signature] 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. Final

1) and 2) All valves and interfaces were checked and found to satisfy the licensing basis. 3) N/A

Resp. Org. M R Below 1/9/84 Task Force Concurrence [signature] 1/9/84

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 [signature] 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. M R Below 1/9/84 Task Force Concurrence [signature] 1/9/84

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

B. Final

N/A

Resp. Org. M R Below 1/9/84 Task Force Concurrence W Gleason 1/9/84

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. M R Below 1/9/84 Task Force Concurrence W Gleason 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 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 S1 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 1/9/84 Task Force Concurrence W Gleason 1/9/84

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

Corrections identified in 10A.B are in place.

Resp. Org. M R Belew 1/9/84 Task Force Concurrence [signature] 1/9/84

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. ~~Org.~~ [signature] 11/30/84 Task Force Concurrence [signature] 12/31/84

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

N/A

Resp. Org. M R Belew 1/9/84 Task Force Concurrence / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

N/A

Resp. Org. M R Belew 11/9/84 Task Force Concurrence / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

N/A

Resp. Org. M R Belew 11/9/84 Task Force Concurrence / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

N/A

Resp. Org. M R Belew 11/9/84 Task Force Concurrence / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

N/A

Resp. Org. M R Belew 1/9/84 Task Force Concurrence ____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

N/A

Resp. Org. M R Belew 1/9/84 Task Force Concurrence ____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

N/A

Resp. Org. ____ / / Task Force Concurrence ____ / /

TVA 84 (08-0-85)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

QMS '841126 201

TO : Quality Management Staff Files

FROM : J. W. von Weisenstein, 384 SPB-K

8411290353 (5)

DATE : NOV 26 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."

J. W. von Weisenstein

JvW:MBP

Attachments

cc: 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 (7706)

11/26/84 - EGB:MBP

cc (Attachments):
R. W. Cantrell, W11A9 C-K
MEDS, W5B63 C-K

02520

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

2101

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 Units 1 and 2
CATEGORY: 5

Prepared By: D. Anthony Valentine
Date: 11/20/84

Approved By: [signature]
Date: 11.20.84

****

Concerns: NO /__/ 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 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:

1. 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 ANSI 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.

02420

2. Verify the results of the review in section III.A.1 by sampling:

   Results: Obtained a copy of a WBN valve evaluation (EEB 830629 902) and copies of NCR WBNEEB8207 and ECN 3511. The NCR and ECN changed the procurement design specifications to agree with design pressure/temperature on drawing 47W803-2.

3. 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 Marvin 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.

2. Verify that a memorandum was issued in conjunction with EP 4.02 R13 to control the ECN S1.

   Results: There were three memorandums written in conjunction with EP 4.02 R13 that dealt with the changing of procedure for control of ECN S1 (QAB 830301 001, OQA 830527 002, and OQA 830712 500).

3. Verify that EP 5.06 has been issued.

   Results: EP 5.06 R1 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.

02420

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
ECN 3511
Memorandums: P. L. Duncan's memorandum to R. M. Painter dated March 1, 1983, "EN DES-EP 4.02, Engineering Change Notice (ECN - Handling - TVA ECN S1 Update" (QAB 830301 001)

J. W. Anderson's memorandum to M. N. Sprouse dated May 27, 1983, "Stopwork Action - Processing Design Changes by ECN S1" (OQA 830527 002)

R. A. Costner's memorandum to M. 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	EEB
T. G. Robinson	Electrical Engineer	EEB
Jerry Dorris	Section Supervisor	WBEP

VI. Scoping Document (Attached)

02420

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 Units 1 and 2
CATEGORY: 5

Prepared By: L E Brock
Date: 10/18/84

Approved By: [signature]
Date: 10-23-84

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.

02420

TVA

GROUP: INSTRUMENTATION AND CONTROLS
TITLE: Preparation of Data Sheets for Purchase Requests

ELECTRICAL DESIGN STANDARD DS-E18.3.5

	R0	R1	R2	R3
PREP'D				
REVIEW'D				
APPR'D				

ORIG ISSUE: 5-15-84
REV NO.:
REV DATE:

8407170001 119

ESB 840605 202

1.0 GENERAL

This design standard[1] 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.

0 0 0 1

b. Information in 7.0 Detailed Requirements can be either written descriptions, completed data 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 I&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

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 QEB-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

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.

a. 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, seismic category I(L) and IEEE Class 1E 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 ink other 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.

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." blanks 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.

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-	Title
01	General
02	Steam Orifice Plate
03	Liquid Orifice Plate
04	Gas Orifice Plate
05	Thermocouples and Test Wells
06	Level Switches
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	Pneumatic Controller
19	Power Supply
20	Electrical Indicators
21	Bimetal Thermometers and Mating Wells
22	Liquid Level Gauges
23	Pressure Transmitter (Electronic)
24	Solenoid Valves
25	Rotameters
26	Displacer Type (Pneumatic) Level Controller
27	Displacer Type (Electronic) Level Controller/Transmitter
28	Square Root Converter
29	Limit Switches
30	Environmental Conditions for Class 1E 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

b. American National Standards Institute (ANSI) 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 Celsius
CA	- Calibrated accuracy
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
DISPL	- Displacer
ECN	- Engineering Change Notice
EFF	- Effect
ELEC	- Electrical
EMF	- Electromotive force
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

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 - Light
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 - 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

SIG	- Signal
SOV	- Solenoid valve
SPGR	- Specific gravity
SPLY	- Supply
SST	- Stainless steel
SUPRHT	- Superheat
SW	- Switch
SYS	- System
TC	- Thermocouple
TEMP	- Temperature
TERM	- Termination
THD	- Thread
T-P	- Temperature and pressure
UNGND	- Ungrounded
UNID	- Unique identification
VIS	- Visible
V	- Valve
WC	- Water column
WG	- Water gauge
WS	- Wetted surface
XFR	- Transfer
ΔP	- Differential pressure
%	- Percent
#	- Pounds
#/hr	- Pounds per hour
1 Ø	- Single phase
*	- Or equal

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 labeled "1E", 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.

---

1. If the instrument forms part of an instrument loop, Form TVA-10581-31 must also be completed (see B31.0).

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--Identify the project.

PR--Enter the procurement request number.

ECN--Enter the ECN number when applicable.

DSGNR--Identify yourself and the date.

CHKR--Have the checker initial and date.

Notes:

1. 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 note 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.

2. 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.

3. Data sheet sections marked "Bidder information" are to be completed by the bidder only; do not write in these spaces.

4. If devices are specified as IEEE Class 1E, 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.)

TVA 10581-01 (EN DES-2-84)

REQUISITION NO.

GENERAL	1	ITEM NO.	
	2	QUANTITY	
	3	INSTRUMENT NO.	
	4	IEEE CLASS	( )1E ( )NA
	5	SEISMIC CATEGORY	( )1 ( )1(L) ( )NA
	6	ASME CODE CLASS	( )NA
	7	MANUFACTURER	
	8	MODEL NO.	
	9	CASE STYLE/MATL	
	10	ENCLOSURE	
	11	MOUNTING	
	12		
	13		
	14		
	15		
	16		
	17		
	18		
	19		
	20		
	21		
	22		
	23		
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	38		
	39		
	40		
	41		
	42		
	43		
	44		
	45		
	46		
	47		
	48		

X---DATA BY BIDDER
*---OR EQUAL
NA--NOT APPLICABLE
MS--MFR STANDARD

DSGNR: DATE:
CHKR: DATE:

NOTES: (1)

SPECIFICATION NO.

PLANT:

PR NO.
ECN NO.

DATA SHEET NO.

0 0 1 3

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 18 - 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.

---

1. Completion of TVA 10581-31 also required (see B31.0).

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 recorder, 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 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--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").

PLANT:

GENERAL

1	ITEM NO.		
2	QUANTITY		
3	INSTRUMENT NO.		
4			
5	SEISMIC CATEGORY	( ) I ( ) I(L)	( )NA
6	ASME CODE		( )NA
7	MANUFACTURER		
8	MODEL NO.		
9			
10			

GENERAL

11	MOUNTING		
12	STEAM QUALITY		
13	STEAM SUPRHT		
14	BAPQ PRESS.		
15	ACCURACY	FROM:	TO:
16	METER TYPE		
17			
18	MATERIAL PLATE		
19	DRAIN HOLE		
20	TAP LOCATION		

ITEM NO.	INSTRUMENT NO.	QTY	PIPE SIZE	PIPE SCHED OR ID	OPRG TEMP, F	OPRG PRESS. PSI	FLOW RATE, Lbm/HR MAX	FLOW RATE, Lbm/HR NORM	METER DIFF ANGE (2)	METER SCALE MAX	REMARKS

(X) BIDDER INFORMATION (BELOW)

ITEM BID	MODEL NO.	UNIT PRICE	BETA RATIO	THICK-NESS	BORE DIA	BID DATA

PR NO.
ECN NO.

SPECIFICATION NO.
STEAM ORIFICE PLATE
DATA SHEET NO.

REQUISITION NO.

X - DATA BY BIDDER
* - OR EQUAL
NA - NOT APPLICABLE
MS - MANUFACTURER STANDARD

DSGNR: DATE:
CHKR: DATE:

NOTES:
(1) SUCCESSFUL BIDDER TO ASSUME STANDARD VALUES FOR OTHER DATA AND SUPPLY CALCULATIONS AND DATA FOR EACH ORIFICE PLATE.
(2) CALIBRATED DRY UNLESS SPECIFIED OTHERWISE.
(3) INST NO. AND BORE DIA SHALL BE STAMPED ON EACH TAB WITH 1/8" HIGH LETTERS.

TVA 1581-02 (EN DES-2-84)

B2-3

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°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" downstream) "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 accomodate 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.

---

1. Completion of TVA 10581-31 also required (see B31.0).

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 PRESS 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").

TVA 10581-03 (EN DES-2-84)

PLANT:

GENERAL

1	ITEM NO.		11	MOUNTING	
2	QUANTITY		12	LIQUID	
3	INSTRUMENT NO.		13	BASE TEMP	
4			14	SG @ BASE TEMP	
5	SEISMIC CATEGORY	( )1 ( )1(L) ( )NA	15	ACCURACY	FROM: TO:
6	ASME CODE CLASS	( )NA	16	METER TYPE	
7	MANUFACTURER		17		
8	MODEL NO.		18	MATERIAL PLATE	
9			19	VENT LOCATION	
10			20	TAPE LOCATION	

ITEM NO.	INSTRUMENT NO.	QTY	PIPE SIZE	PIPE SCHED OR ID	OPRG TEMP, F	OPRG PRESS. PSI	FLOW RATE, GPM MAX	FLOW RATE, GPM NORM	METER DIFF (2) RANGE	METER SCALE MAX	REMARKS

PR NO.
ECN NO.

BIDDER INFORMATION (BELOW)

ITEM BID	MODEL NO.	UNIT PRICE	≅ BETA RATIO	THICK-NESS	BORE DIA	BID DATA

REQUISITION NO.

SPECIFICATION NO.
LIQUID
ORIFICE PLATE
DATA SHEET NO.

X---DATA BY BIDDER
*---OR EQUAL
NA--NOT APPLICABLE
MS--MANUFACTURER STANDARD

DSGNR: DATE:
CHKR: DATE:

NOTES: (1) SUCCESSFUL BIDDER TO ASSUME REASONABLE VALUES FOR OTHER DATA AND SUPPLY CALCULATIONS AND DATA FOR EACH ORIFICE PLATE.
(2) CALIBRATED DRY UNLESS SPECIFIED OTHERWISE.
(3) INST NO. AND BORE DIA SHALL BE STAMPED ON EACH TAB WITH 1/8" HIGH LETTERS.

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: 15CFM 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 15 - BASE PRESS--Give the absolute pressure on which the volumetric measure at standard conditions is based.

Line 16 - BARO PRESS--Give the average barometric pressure or the altitude above sea level.

Line 17 - METER TYPE--Bellows, diaphragm, mercury, etc.

Line 18 - CR (F_{py}) BASE--Give the supercompressibility factor if known. 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" downstream), "vena contracta" (1 PD upstream and at the vena contracta downstream), or "pipe taps" (2-1/2 PD upstream and 8 PD downstream).

---

1. Completion of TVA 10581-31 also required (see B31.0).

Columns - The columns can accomodate 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 number.

PIPE SIZE--Nominal pipe size.

SCHED OR ID--Give the pipe schedule number or give the exact internal 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").

PLANT:

GENERAL

1	ITEM NO.	
2	QUANTITY	
3	INSTRUMENT NO.	
4		
5	SEISMIC CATEGORY	( )1 ( )1(L) ( )NA
6	ASME CLASS	
7	MANUFACTURER	
8	MODEL NO.	
9		
10	ACCURACY	FROM: TO:

GENERAL

11	MOUNTING	
12	GAS	
13	BASE TEMP	
14	SG @ BASE TEMP	
15	BASE PRESS.	
16	BAROPRESS	
17	METERTYPE	
18	CR (Fpv) BASE	
19	MATERIAL PLATE	
20	DRAIN HOLE	
21	TAP LOCATION	

ITEM NO.	INSTRUMENT NO.	QTY	PIPE SIZE	PIPE SCHED OR ID	TEMP, F	PRESS. PSIG	FLOW RATE, XCFM MAX	FLOW RATE, XCFM NORM	METER DIFF RANGE(2)	METER SCALE MAX	REMARKS

PR NO.

ECN NO.

(X) BIDDER INFORMATION (BELOW)

ITEM BID	MODEL NO.	UNIT PRICE	≅ BETA RATIO	THICK-NESS	BORE DIA	BID DATA

DATA SHEET NO. R

ORIFICE PLATE

GAS

SPECIFICATION NO.

X---DATA BY BIDDER
*---OR EQUAL
NA--NOT APPLICABLE
MS--MANUFACTURER STANDARD
CR--COMPRESSIBILITY RATIO

DSGNR: DATE:
CHKR: DATE:

NOTES: (1) SUCCESSFUL BIDDER TO ASSUME STANDARD VALUES FOR OTHER DATA AND SUPPLY CALCULATIONS AND DATA FOR EACH ORIFICE PLATE.
(2) CALIBRATED DRY UNLESS SPECIFIED OTHERWISE.
(3) INST NO. AND BORE DIA SHALL BE STAMPED ON EACH TAB WITH 1/8" HIGH LETTERS.

TVA 1058.-04 (EN DES-2-84)

REQUISITION NO.

B4-3

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 Measurement 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 drilled or a built-up well is required.

Line 21 - CONN SIZE--Specify the process or external connection size.

Columns - The columns can accomodate 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 flowing 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.

PLANT:

GENERAL	1	ITEM NO.		GENERAL	12	ISA TYPE	
	2	QUANTITY			13	GAUGE	
	3	INSTRUMENT NO.			14	SHEATHED	( )NO ( )YES MATL:
	4	IEEE CLASS	( )1E ( )NA		15	INSULATION	
	5	SEISMIC CATEGORY	( )1 ( )1(L) ( )NA		16	NIPPLE SIZE - IPS	UNION ( )YES ( )NO
	6	ASME CODE CLASS	( )NA		17	CONDUIT CONN	
	7	MANUFACTURER			18	WELL( ) TUBE( )	MATL
	8	MODEL NO.			19	TYPE	( )TAPERED ( )STRAIGHT
	9	CASE STYLE/MATL			20	CONSTRUCTION	( )DRILLED ( )BUILTUP
	10	HEAD MATERIAL			21	CONN SIZE	
	11				22		

ITEM NO.	INSTRUMENT NO.	QTY	DIMENSION N	DIMENSION T	DIMENSION U	DESIGN PRESS.	DESIGN TEMP	FLUID	VELOCITY FT/S	GROUNDED OR UNGND	REMARKS

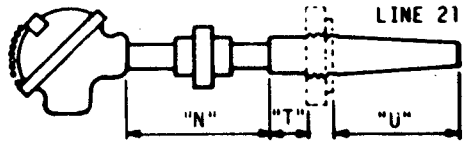
TVA 10581-05 (EN DES-2-84)

PR NO.
ECN NO.

REQUISITION NO.

BIDDER INFORMATION (BELOW)

ITEM BID	MODEL NO.	UNIT PRICE	BID DATA



REFERENCE: ANSI MC96.1-1975, "TEMPERATURE MEASUREMENT THERMOCOUPLES"

SPECIFICATION NO.

THERMOCOUPLES & TEST WELLS DATA SHEET NO.

X---DATA BY BIDDER
*---OR EQUAL
NA--NOT APPLICABLE
MS--MANUFACTURER STANDARD

DSGNR: DATE:
CHKR: DATE:

NOTES: (1) THERMOCOUPLE ELEMENTS (MARK "TE-...", ETC.) SHALL MATE WITH AND FIT IN THE WELL (MARK "TW-...", ETC.) OF THE SAME NUMBER.
(2)

B5-3

8 0 0 2 5

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, semi-conductor, 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 accomodate 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.

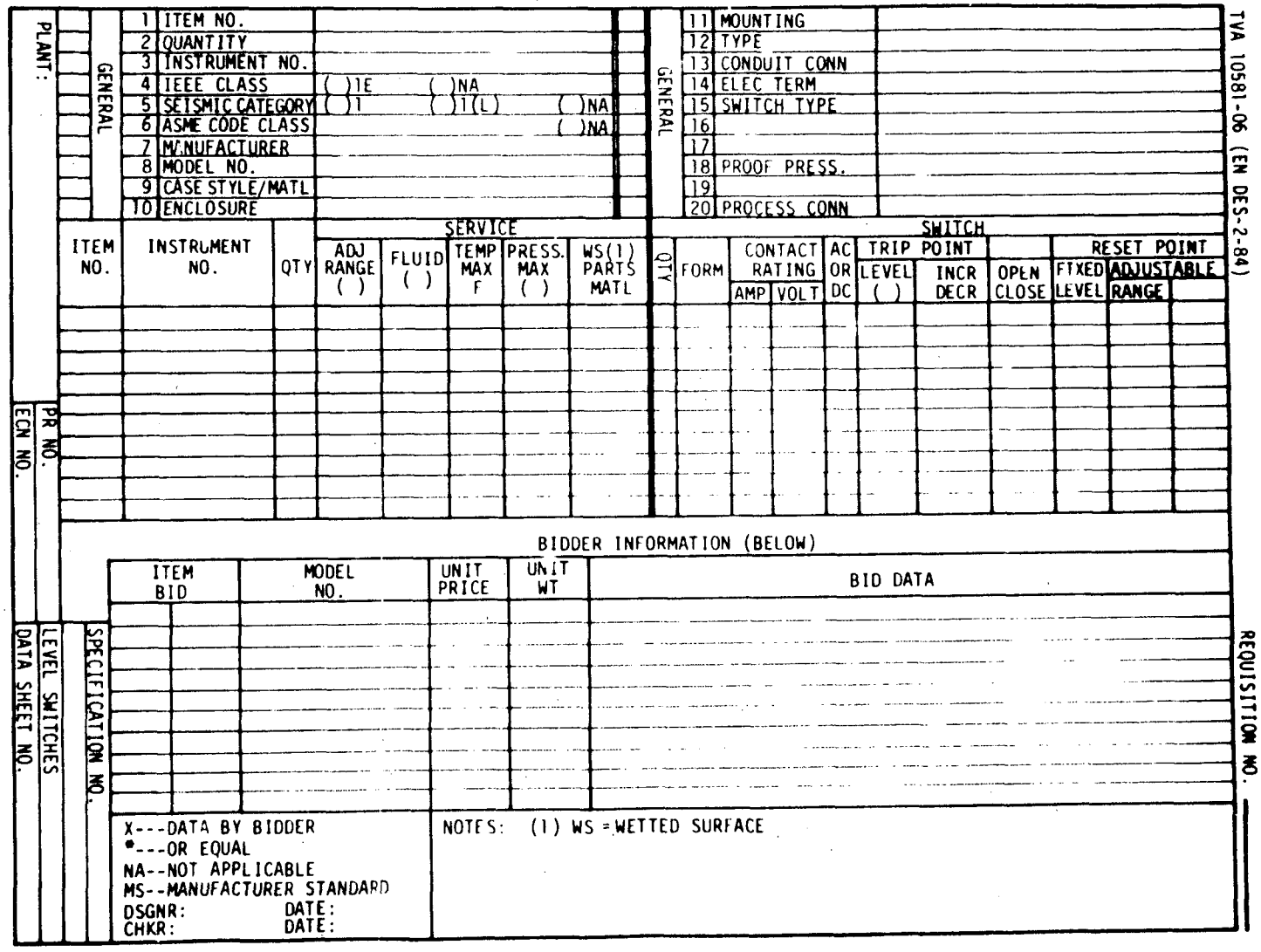
SERVICE - WS PARTS MATL--List the materials of construction for the wetted surface parts.

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 required repeatability. If reset point must be field adjustable, specify the range of adjustment and the required repeatability of the reset point in engineering units.



PLANT:

GENERAL

1	ITEM NO.	
2	QUANTITY	
3	INSTRUMENT NO.	
4	IEEE CLASS	( )1E ( )NA
5	SEISMIC CATEGORY	( )1 ( )1(L) ( )NA
6	ASME CODE CLASS	( )NA
7	MANUFACTURER	
8	MODEL NO.	
9	CASE STYLE/MATL	
10	ENCLOSURE	

GENERAL

11	MOUNTING	
12	TYPE	
13	CONDUIT CONN	
14	ELEC TERM	
15	SWITCH TYPE	
16		
17		
18	PROOF PRESS.	
19		
20	PROCESS CONN	

ITEM NO.	INSTRUMENT NO.	QTY	SERVICE					SWITCH									
			ADJ RANGE ( )	FLUID ( )	TEMP MAX F	PRESS. MAX ( )	WS(1) PARTS MATL	QTY	FORM	CONTACT RATING AMP	CONTACT RATING VOLT	AC OR DC	TRIP POINT LEVEL ( )	TRIP POINT INCR DECR	OPEN CLOSE	RESET POINT FIXED LEVEL	RESET POINT ADJUSTABLE RANGE

BIDDER INFORMATION (BELOW)

ITEM BID	MODEL NO.	UNIT PRICE	UNIT WT	BID DATA

X---DATA BY BIDDER
*---OR EQUAL
NA--NOT APPLICABLE
MS--MANUFACTURER STANDARD
DSGNR: DATE:
CHKR: DATE:

NOTES: (1) WS = WETTED SURFACE

ECN NO.

PR NO.

DATA SHEET NO.

LEVEL SWITCHES

SPECIFICATION NO.

REQUISITION NO.

TVA 10581-06 (EN DES-2-84)

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 accomodate 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.

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, REPEATABILITY--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.

PLANT:

GENERAL

1	ITEM NO.			11	MOUNTING		
2	QUANTITY			12			
3	INSTRUMENT NO.			13	CONDUIT CONN		
4	IEEE CLASS	( )1E	( )NA	14	ELEC TERM.		
5	SEISMIC CATEGORY	(1) ( )1(L)	( )NA	15	SWITCH TYPE		
6	ASME CODE CLASS		( )NA	16			
7	MANUFACTURER			17			
8	MODEL NO.			18	PROOF PRESS.		
9	CASE STYLE/MATL			19			
10	ENCLOSURE			20	PROCESS CONN		

ITEM NO.	INSTRUMENT NO.	QTY	SERVICE				SWITCH											
			ADJ RANGE ( )	FLUID	TEMP MAX F	PRESS. MAX ( )	QTY	FORM	CONTACT RATING AMP	CONTACT RATING VOLT	AC OR DC	TRIP POINT PRESS ( )	TRIP POINT INCR DECR	TRIP POINT OPEN CLOSE	RESET POINT FIXED PRESS	RESET POINT ADJUSTABLE RANGE	RESET POINT ADJUSTABLE REPEATABILITY	

BIDDER INFORMATION (BELOW)

ITEM BID	MODEL NO.	UNIT PRICE	UNIT WT	BID DATA

ECN NO.

PR NO.

PRESSURE SWITCHES DATA SHEET NO.

SPECIFICATION NO.

X---DATA BY BIDDER
•---OR EQUAL
NA--NOT APPLICABLE
MS--MANUFACTURER STANDARD
DSGNR: DATE:
CHKR: DATE:

NOTES: (1) WS = WETTED SURFACE

TVA 10581-07 (EN DES-2-84)

REQUISITION NO.

B7-3

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 numerals 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 Grade	Permissible Error (% OF Span) Lower 1/4 of Scale	Middle 1/2 of Scale	Upper 1/4 of Scale
4A		0.1	
3A		0.25	
2A		0.5	
A	2.0	1.0	2.0
B	3.0	2.0	3.0
C	4.0	3.0	4.0
D		5.0	

Source: ANSI B40.1-1980

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 "NS."

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 accomodate listing more than one pressure 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.

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 10581-08 (EN DES-2-84) REQUISITION NO. _____

	GENERAL	1	ITEM NO.	
		2	QUANTITY	
		3	INSTRUMENT NO.	
		4	TVA PIPE CODE	(TVA USE ONLY)
		5	SEISMIC CATEGORY	( )I(L) ( )NA
		6	ASME CODE CLASS	( )NA
		7	MANUFACTURER	
		8	MODEL NO.	
		9	CASE MATL	( )PHENOL ( )POLYPROPYLENE ( )ALUMINUM ( )MS
		10	WINDOW MATL	( )PLASTIC ( )SHATTERPROOF GLASS
		11	MOUNTING	
		12	PULSATION DAMPING	( )YES ( )NO
		13	DIAL: DIA & COLOR	4-1/2", BLACK ON WHITE
		14	ACCURACY GRADE (1)	
		15		
		16	ELEMENT TYPE	BOURDON
		17	WS PARTS MATL	
		18	% OVERRANGE	
		19	BLOWOUT PROTECTION	SOLID FRONT
		20	CONNECTIONS	1/2" BACK

ITEM NO.	INSTRUMENT NO.	QTY	RANGE	REMARKS	MODEL BID	UNIT PRICE

X---DATA BY BIDDER
*---OR EQUAL
NA--NOT APPLICABLE
MS--MANUFACTURER STANDARD
VP--VACUUM PROTECTED
WS--WETTED SURFACE

DSGNR: DATE:
CHKR: DATE:

NOTES: (1) ANSI B40.1-1980

PLANT:	PR NO.	SPECIFICATION NO.
	ECN NO.	PRESSURE GAUGES
		DATA SHEET NO. R

0 0 3 4

B9.0 RECORDERS (TVA-10581-09)[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 required conduit connection size.

Line 14 - POWER SUPPLY--Enter the power available such as 117V - 60Hz - 1Ø.

Line 16 - INTERNAL ILLUM--Mark "yes" if internal illumination is required, "no" if it is not required.

Line 17 - MARK TYPE--Mark the type of marking technique required (thermal, ink, etc.).

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.

---

1. Completion of TVA 10581-31 also required (see B31.0).

Line 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 B...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 35 - ALARM SWITCH--Mark "Yes" if alarm switches are required; "No" otherwise.

Line 36 - QUANTITY TYPE--If 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.

Line 39 - INPUT SIGNAL--Enter the range and type of input such as "4-20 ma DC" or "type E thermocouple."

Line 40 - INPUT IMPEDANCE--Enter the minimum or maximum impedance as applicable.

Columns - The columns can accomodate 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.

REMARKS--Indicate whether the scale graduations are uniform, square root, or thermocouple curve. Also list any accessories or special features which might be required.

MODEL BID and UNIT PRICE--These columns are to be filled in by the vendor when he submits his proposal.

TVA 10581-09 (EN DES-2-84)

REQUISITION NO.

GENERAL	1	ITEM NO.			
	2	QUANTITY			
	3	INSTRUMENT NO.			
	4	IEEE CLASS	( )1E ( )NA		
	5	SEISMIC CATEGORY	( )1 ( )1(L) ( )NA		
	6				
	7	MANUFACTURER			
	8	MODEL NO.			
	9	CASE STYLE/MATL			
	10	ENCLOSURE			
	11	MOUNTING			
	12	UNIT WEIGHT			
	13	CONDUIT CONN			
	14	POWER SUPPLY			
	15				
	16	INTERNAL ILLUM			
	17	MARK TYPE	( )INK ( )THERMAL		
	18	CHARTS			
	19	INKSET			
	20	AMBIENT TEMP			
CHART	21	CHART SIZE			
	22	CHART STYLE			
	23	CHART SPEED			
	24	CHART MARKING			
DETAIL	25				
	26	ACCURACY			
	27				
	28				
	29				
	30				
	31				
	32	RESPONSE TIME			
	33				
	34	OVERLOAD			
	35	ALARM SWITCH	( )YES ( )NO		
	36	QUANTITY/TYPE			
	37	CONTACT RATING			
	38				
	39	INPUT SIGNAL			
	40	INPUT IMP			

ITEM NO.	INSTRUMENT NO.	QTY	NO. OF PENS	SCALE	REMARKS	MODEL BID	UNIT PRICE

X - DATA BY BIDDER
• - OR EQUAL
NA - NOT APPLICABLE
MS - MFR STANDARD

DSGNR: DATE:
CHKR: DATE:

NOTES: (1)

SPECIFICATION NO.

PLANT:

PR NO.
ECN NO.

RECORDERS
DATA SHEET NO. R

0 0 3 8

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 - 60Hz - 1Ø.

Line 18 - ISOLATION--Indicate if isolation is required between input-output, 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 accomodate 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).

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."

PLANT:

GENERAL

1	ITEM NO.		
2	QUANTITY		
3	INSTRUMENT NO.		
4	IEEE CLASS	( )1E	( )NA
5	SEISMIC CATEGORY	( )I ( )I(1)	( )NA
6			
7	MANUFACTURER		
8	MODEL NO.		
9	CASE STYLE/MATL		
10	ENCLOSURE		

GENERAL

11	MOUNTING	
12		
13	CONDUIT CONN	
14	ELEC TERM.	
15	SWITCH TYPE	
16	INTEGRAL ALM LT	
17	SUPPLY POWER	
18	ISOLATION	
19	INPUT SIGNAL	
20	AMBIENT TEMP	

IVA 10581-10 (EN DES-2-84)

ITEM NO.	INSTRUMENT NO.	QTY	SWITCH FORM	CONTACT RATING XMP	CONTACT RATING VOLT	AC OR DC	TRIP OPEN CLSD	TRIP INCR DECR	TRIP TRIP RNG	TRIP	RESET FIXED RNG	RESET ADJUSTABLE RANGE	RESET ADJUSTABLE REPEATABILITY	REMARKS

(X) BIDDER INFORMATION (BELOW)

ITEM BID	MODEL NO.	UNIT PRICL	UNIT WT	BID DATA

REQUISITION NO.

PR NO.

ECN NO.

ALARM SWITCHES

DATA SHEET NO.

SPECIFICATION NO.

X - DATA BY BIDDER
• - OR EQUAL
NA - NOT APPLICABLE
MS - MANUFACTURER STANDARD
CA - CALIBRATED ACCURACY
DSGNR: DATE:
CHKR: DATE:

NOTES: (1)

B10-3

B11.0 DIFFERENTIAL PRESSURE GAUGES (TVA 10581-11)

Deleted. Refer to B12.0 for specifying differential pressure gauges.

B12.0 DIFFERENTIAL PRESSURE INDICATING SWITCHES (TVA-10581-12)[1]

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 accomodate 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).

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 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.

RESET, ADJUSTABLE, RANGE, REPEATABILITY--If field adjustable reset is required, specify the adjustable range and repeatability in engineering units.

TVA 10581-12 (EN DES-2-84)

PLANT:

GENERAL

1	ITEM NO.		
2	QUANTITY		
3	INDICATING	( )YES	( )NO
4	IEEE CLASS	( )1E	( )NA
5	SEISMIC CATEGORY	( )1 ( )1(L)	( )NA
6	ASME CODE CLASS		( )NA
7	MANUFACTURER		
8	MODEL NO.		
9	CASE STYLE/MATL		
10	ENCLOSURE		
11	MOUNTING		

GENERAL

12	WINDOW MATL	( )PLASTIC ( )SHATTERPROOF GLASS
13	UNIT WEIGHT	
14	CONDUIT CONN	
15	ELEC TERM.	
16	SWITCHES	( )YES ( )NO
17	INDR ACCURACY	
18		
19	OVERRANGE	
20	FLUID	
21	PROCESS CONN	
22	PULSATION DAMPING	( )YES ( )NO

ITEM NO.	INSTRUMENT NO.	QTY	SERVICE: DIFF RANGE ( )	SCALE ( )	SCALE TYPE	TEMP MAX F	PRESS. MAX ( )	SWITCH: QTY	FORM	CONTACT RATING AMP	CONTACT RATING VOLT	AC OR DC	TRIP	TRIP: OPEN CLSD	TRIP: INCR DECR	TRIP: RANGE	RESET: FIXED RANGE	RESET: ADJUSTABLE RANGE	RESET: ADJUSTABLE

PR NO.
ECN NO.

B12-4

(X) BIDDER INFORMATION (BELOW)

ITEM BID	MODEL NO.	UNIT PRICE	UNIT WT	BID DATA

SPECIFICATION NO.
DIFFERENTIAL PRESSURE INDICATING SWITCHES
DATA SHEET NO.

REQUISITION NO.

X - DATA BY BIDDER
* - OR EQUAL
NA - NOT APPLICABLE
MS - MANUFACTURER STANDARD
WS - WETTED SURFACE
DSGNR: DATE:

NOTES: (1) INCLUDE 3-VALVE MANIFOLD FOR EACH SWITCH ASSEMBLY.

CHKR:

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" if 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 14 - 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 accomodate 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.

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), otherwise 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 <u>minimum</u> and <u>maximum</u> 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.

TVA 10581-13 (EN DES-2-84)

PLANT:

	No.	Item	Entry		No.	Item	Entry
GENERAL	1	ITEM NO.		GENERAL	11	MOUNTING	
	2	QUANTITY			12	UNIT WEIGHT	
	3	INDICATING	( )YES ( )NO		13	CONDUIT CONN	
	4	IEEE CLASS	( )1E ( )NA		14	ELEC TERM.	
	5	SEISMIC CATEGORY	( )I ( )I(L) ( )NA		15	SWITCH TYPE	
	6	ASME CODE CLASS	( )NA		16	ACCURACY	
	7	MANUFACTURER			17	REPEATABILITY	
	8	MODEL NO.			18	ELEMENT	
	9	CASE/STYLE/MATL			19	WELL	
	10	ENCLOSURE			20	PROCESS CONN	

ITEM NO.	INSTRUMENT NO.	QTY	ADJ RANGE ( )	SCALE RANGE (1)	SERVICE: FLUID ( )	SERVICE: TEMP MAX F	SERVICE: PRESS. MAX ( )	SWITCH: QTY	SWITCH: FORM	SWITCH: CONTACT RATING AMP	SWITCH: CONTACT RATING VOLT	SWITCH: AC OR DC	SWITCH: DEAD BAND ( ) MIN	SWITCH: DEAD BAND ( ) FIX	SWITCH: DEAD BAND ( ) ADJ	ACTION: OPEN CLOSE	ACTION: INCR DECR	TRIP POINT: STGT ( )	TRIP POINT: INCR DECR

PR NO.

ECN NO.

(X) BIDDER INFORMATION BELOW

ITEM BID	MODEL NO.	UNIT PRICE	UNIT WT	BID DATA

X---DATA BY BIDDER
*---OR EQUAL
NA--NOT APPLICABLE
MS--MANUFACTURER STANDARD
WS--WETTED SURFACE
ENGR: DATE:

NOTES: (1) SCALE RANGE LISTED FOR INDICATING SWITCHES ONLY.

SPECIFICATION NO.

TEMPERATURE SWITCHES

DATA SHEET NO. R

REQUISITION NO.

B13-3

B14.0 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 valve will be used. If schedule is unknown or special, give wall thickness or ID.

Line 12 - MAX LINE PRESS (PSIG)--Designate the design pressure for the line.

Line 13 - MAX ΔP (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."

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.

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 <u>minimum</u> and <u>maximum</u> 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."

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 rates.

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 - ΔP (PSI)--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.

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.

		1	ITEM NO.					MFR DATA (IF APP)	
	GENERAL	2	QUANTITY						
		3	INSTRUMENT NO.						
		4	IEEE CLASS (1)	( )1E		( )NA			
		5	SEISMIC CATEGORY	( )1	( )1(L)	( )NA			
		6	ASME CODE CLASS			( )NA			
		7	MANUFACTURER						
		8	MODEL NO.						
		9	SERVICE						
		10	ACTION/INPUT SIGNAL						
	DESIGN	11	LINE SIZE/SCHEDULE/MAT'L						
		12	MAX LINE PRESS. (PSIG)						
		13	MAX ΔP (VLV CLOSED)						
		14	MAX TEMP & RADIATION						
	BODY	15	SIZE/STYLE						
		16	ANSI CLASS/MATERIAL						
		17	END CONNECTIONS						
		18	BONNET TYPE						
		19	PACKING						
		20	LEAKOFF CONNECTIONS						
		21	MAX ALLOW SOUND LEVEL (dBA)						
	TRIM	22	FLOW CHARACTERISTIC						
		23	MATERIAL						
		24	NO. OF PORTS/PORT SIZE						
		25	GUIDING						
		26	SPECIAL TRIM						
		27	SEAT LKG (ANSI/FCI 70-2)	CLASS:					
	ACT.	28	TYPE						
		29	SIZE & STROKE						
		30	SUPPLY						
		31	FAILURE POSITION						
	POS'NER	32	MANUFACTURER & MODEL						
		33	BYPASS/GAUGES						
		34	FOR INPUT OF						
		35	VALVE SHALL BE						
	ACCESSORIES	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						
		43							
	OPER COND	44	FLOWING MEDIUM						
		45	SIZING CONDITIONS AT	MAX FLOW	NOR FLOW	MIN FLOW		MAX FLOW	NOR FLOW	MIN FLOW
		46	FLOW RATE							
		47	PRESSURE (PSIA) (P1)							
		48	TEMPERATURE (F)							
		49	ΔP (PSI)							
		50	CV (CALC)		NA				NA	
		51	CV (ACTUAL)		NA				NA	

X---DATA BY BIDDER
*---OR EQUAL
NA--NOT APPLICABLE
MS--MFR STANDARD

DSGNR: DATE:
CHKR: DATE:

NOTE: (1) ELECTRICAL ACCESSORIES ONLY
(2) SPECIAL CONDITION: $P_2 > P_1$, YES ☐ NO ☐
P_2 (PSIA) = , P_1 (PSIA) =

PLANT:

PR NO.
ECN NO.

SPECIFICATION NO.
CONTROL VALVES
DATA SHEET NO. R

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".

---

1. Completion of Form TVA 10581-31 also required (see B31.0).

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 - T/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, usually 4 to 20 mA dc.

Columns - The columns can accomodate 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.

MODEL BID and UNIT PRICE--These columns are to be filled in by the vendor when he submits his proposal.

TVA 10581-15 (EN DES-2-84)

REQUISITION NO. _____

GENERAL

1	ITEM NO.		21		
2	QUANTITY		22		
3	INSTRUMENT NO.		23	INPUT/GND ISOL	
4	IEEE CLASS	( )1E ( )NA	24	INPUT/OUT ISOL	
5	SEISMIC CATEGORY	( )1 ( )1(L) ( )NA	25	OUTPUT/GND ISOL	
6			26		
7	MANUFACTURER		27		
8	MODEL NO.		28	SENS LINEARIZE	( )YES ( )NO
9	CASE STYLE/MATL		29		
10	ENCLOSURE		30	TC BURNOUT	
11	MOUNTING		31	ZERO ADJ	
12	UNIT WEIGHT		32		
13	CONDUIT CONN		33	SPAN ADJ	
14	POWER SUPPLY	117V, 60HZ	34		
15			35	REF JUNCTION	
16			36	INPUT IMPD	
17			37	INPUT SIGNAL	
18	POWER REQ		38	T/C TYPE	( )NA
19			39	OUTPUT IMPD	
20	AMBIENT TEMP		40	OUTPUT SIGNAL	

ITEM NO.	INSTRUMENT NO.	QTY	RANGE	REMARKS	MODEL BID	UNIT PRICE

X---DATA BY BIDDER
*---OR EQUAL
NA--NOT APPLICABLE
MS--MFR STANDARD
DSGNR: DATE:
CHKR: DATE:

NOTES: (1)

SPECIFICATION NO.

PLANT:

PR NO.

ECN NO.

EMF TO CURRENT CONVERTER

DATA SHEET NO. R

B16.0 DIFFERENTIAL PRESSURE TRANSMITTER (ELECTRONIC) (TVA-10581-16)[1]

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 ± 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.

Line 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 304SS.

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.

---

1. Completion of Form TVA 10581-31 also required (see B31.0).

Line 30 - AMBIENT TEMP--Enter the ambient temperature limits of the area where devices will be mounted. If the device is designated as Class 1E, 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.).

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.

TVA 10581-16 (EN DES-2-84)

REQUISITION NO. _____

GENERAL	1	ITEM NO.			31		
	2	QUANTITY			32		
	3	INSTRUMENT NO.			33		
	4	IEEE CLASS	( )1E ( )NA		34		
	5	SEISMIC CATEGORY	( )1 ( )1(L) ( )NA		35		
	6	ASME CODE CLASS(1)	( )NA		36		
	7	MANUFACTURER			37		
	8	MODEL NO.			38		
	9	CASE STYLE/MATL			39	OUTPUT/GRD ISOL	
	10	ENCLOSURE			40		
	11	MOUNTING			41	RESPONSE TIME	
	12	UNIT WEIGHT			42		
	13	CONDUIT CONN			43		
	14	POWER SUPPLY			44		
	15	TRANS TYPE	( )2-WIRE ( )4-WIRE		45		
	16				46		
	17				47		
	18	POWER REQ			48	REMOTE AMPL	
	19				49		
	20	ELEC CONN			50		
	21	PROCESS CONN			51	ZERO ADJ	
	22	WS PARTS MATL			52		
	23	OVERRANGE PROT			53	SPAN ADJ	
	24	3-VALVE MANIFOLD	( )YES ( )NO		54	INTEG SQ RT	( )YES ( )NO
	25	VIBRATION			55	PULSE DMP ADJ	( )YES ( )NO
	26				56		
	27				57		
	28				58	LOAD IMPD RANGE	
	29				59		
	30	AMBIENT TEMP			60	OUTPUT SIGNAL	

ITEM NO.	INSTRUMENT NO.	QTY	DIFF PRESS. RANGE	ACTION	DESIGN PRESS.	MODEL BID	UNIT PRICE

X---DATA BY BIDDER
*---OR EQUAL
NA--NOT APPLICABLE
MS--MFR STANDARD
WS--WETTED SURFACE

DSGNR: DATE:
CHKR: DATE:

NOTES: (1) 3-VALVE MANIFOLD ONLY IF REQUIRED (SEE LINE 24)
(2)

PLANT:

PR NO.
ECN NO.

SPECIFICATION NO.
DIFFERENTIAL PRESSURE
TRANSMITTER (ELECTRONIC)
DATA SHEET NO. R

B17.0 ELEC TO ELEC INDICATING CONTROLLER (TVA-10581-17)[1]

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 - 1Ø.

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 B30.0 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."

---

1. Requires completion of form TVA 10581-31 (see section B31.0).

Line 27 - LEGEND PLATE--List the units of 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.

Line 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."

Line 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.

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 accomodate 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.

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.

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.

TVA 10581-17 (EN DES-2-84)

REQUISITION NO. _____

GENERAL	1	ITEM NO.			31	IND ACCURACY	
	2	QUANTITY			32	SET POINT ACCURACY	
	3	INSTRUMENT NO.			33	DEADBAND	
	4	IEEE CLASS	( )1E ( )NA		34	DEADTIME	
	5	SEISMIC CATEGORY	( )1 ( )1(L) ( )NA		35		
	6				36		
	7	MANUFACTURER			37		
	8	MODEL NO.			38		
	9	CASE STYLE/MATL	NEMA		39	CONT ACTION (2)	( ) DIRECT ( )REV
	10	ENCLOSURE			40	PROP BAND ADJ	
	11	MOUNTING			41	RESET ADJ	
	12	UNIT WEIGHT			42	RATE ADJ	
	13	CONDUIT CONN			43	ANTI WINDUP	YES
	14	POWER SUPPLY			44	REMOTE SET POINT	
	15	ELEC CONN			45	INPUT/GRD ISOL	
	16	POWER REQ			46	INPUT/OUT ISOL	
	17	TRANS PWR SUP	( )YES VDC( )NO		47	OUTPUT/GRD ISOL	
	18				48	REPEATABILITY	
	19				49		
	20				50		
	21	AMBIENT TEMP			51		
FRONT PANEL FEATURES	22	AUTO-MAN SW	( )YES ( )NO		52	SPAN ADJ	
	23	DEVIATION METER	( )YES ( )NO		53	ZERO ADJ	
	24	DEVIATION ALARM	( )YES ( )NO		54		
	25	PROCESS IND	( )YES ( )NO		55		
	26	OVERRANGE PROT			56	INPUT SIG	
	27	LEGEND PLATE			57		
	28	INDIC LIGHTS	( )YES COLOR: ( )NO		58		
	29	SET-PT SCALE LG			59		
	30				60	OUTPUT SIGNAL	

ITEM NO.	INSTRUMENT NO.	QTY	MODES		MEAS SCALE	SCALE TYPE		MODEL BID	UNIT PRICE

X---DATA BY BIDDER
*---OR EQUAL
NA--NOT APPLICABLE
MS--MFG STANDARD

NOTES: (1) PROCESS INDICATOR ONLY
(2) SHALL BY FIELD REVERSIBLE

ENGR: DATE:

SPECIFICATION NO.
ELEC TO ELEC
CONTROLLER
DATA SHEET NO.

PLANT:

0 0 6 5

B18.0 PNEUMATIC CONTROLLER (TVA-10581-18)[1]

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 "X" in the box to the left to indicate the bidder 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.

Line 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).

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 "NS."

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 full scale."

Line 46 - SENSITIVITY--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 "NS".

Line 49 - ZERO ADJ--Designate the required zero scale adjustment as plus or minus percent of span or "NS".

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 adjustment desired, such as 0.5 to 25 minutes.

Line 57 - OUTPUT SIGNAL--Give the output signal such as 3 to 15 psig.

Columns - The columns can accomodate 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.

0 0 6 8

TVA 10581-18 (EN DES-2-84)

REQUISITION NO. _____

GENERAL	1	ITEM NO.		PRIMARY ELEMENT	31	ELEMENT TYPE	
	2	QUANTITY			32		
	3	INSTRUMENT NO.			33		
	4				34		
	5	SEISMIC CATEGORY	( )1(L)( )NA		35	OVERRANGE PROT	
	6				36		
	7	MANUFACTURER			37		
	8	MODEL NO.			38		
	9	CASE STYLE/MATL			39	WS PARTS	
	10	ENCLOSURE			40		
CASE	11	MOUNTING		CHARACTERISTICS	41		
	12	UNIT WEIGHT			42	HYSTERESIS	
	13	INDICATING	( )YES ( )NO		43		
	14				44		
	15	SUPPLY AIR			45	RESPONSE TIME	
	16	IN-OUT CONN			46	SENSITIVITY	
	17	INDIC SCALE LG			47	SPAN ADJ	
	18	AIR CONSUMED			48		
	19	AMBIENT TEMP			49	ZERO ADJ	
	20	TEMP EFFECT			50		
	21	AIR SET	( )YES ( )NO	CONTROL	51	AUTO-MAN TRANS	( )YES ( )NO
ACCESSORIES	22	SUPPLY GAUGE	( )YES ( )NO		52	CONTROL ACTION(1)	( )DIRECT ( )REV
	23	OUTPUT GAUGE			53	MODES OF CONT	
	24				54	PROP BAND ADJ	
	25				55	RESET ADJ	
	26				56	RATE ADJ	
	27				57	OUTPUT SIG	
	28				58		
	29	MOUNTING KIT			59		
	30	AUX NAMEPLATE			60		

ITEM NO.	INSTRUMENT NO.	QTY	INPUT SIGNAL	MEAS INCR OUTPUT	MEAS SCALE	SCALE TYPE	REMARKS	MODEL BID	UNIT PRICE

X - DATA BY BIDDER
* - OR EQUAL
NA - NOT APPLICABLE
MS - MFR STANDARD
WS - WETTED SURFACE

DSGNR: DATE:
CHKR: DATE:

NOTES: (1) SHALL BE FIELD REVERSIBLE.

SPECIFICATION NO.
PNEUMATIC
CONTROLLER
DATA SHEET NO.

PLANT:

PR NO.
ECN NO.

8 0 6 4

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 117V 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."

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1. Requires completion of form TVA 10581-31 (see B31.0).

Line 29 - IN/OUTPUT ISOL--Mark "yes" if isolation between the input 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 - OVV 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 accomodate 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 10581-19 (EN DES-2-84)

REQUISITION NO. _____

	GENERAL	1	ITEM NO.			21	AMBIENT TEMP
		2	QUANTITY			22	AMB TEMP EFF
		3	INSTRUMENT NO.			23	
		4	IEEE CLASS	( )1E ( )NA		24	EFFICIENCY
		5	SMC CATEGORY	( )1 ( )1(L)( )NA		25	
		6				26	
		7	MANUFACTURER			27	
		8	MODEL NO.			28	INPUT/GRD ISOL
		9	CASE STYLE/MATL			29	IN/OUTPUT ISOL
		10	ENCLOSURE			30	OUT/GRD ISOL
		11	MOUNTING		CHARACTERISTICS	31	OUTPUT RIPPLE
		12	UNIT WEIGHT			32	OUTPUT
		13	CONDUIT CONN			33	
		14	NOM POWER SPLY	117V, 60 HZ		34	
		15	SUPPLY VOLT RNG			35	
		16	ELEC CONN			36	REGULATION
		17	FUSE ALARM			37	OVV PROT
		18	MULT OUTPUT			38	
		19	SHORT CIR PROT			39	SUP VOLT EFF
		20				40	

ITEM NO.	INSTRUMENT NO	QTY	REMARKS	MODEL NO.	UNIT PRICE

X - DATA BY BIDDER
• - OR EQUAL
NA - NOT APPLICABLE
MS - MFR STANDARD

DSGNR: DATE:
CHKR: DATE:

NOTES: (1)

SPECIFICATION NO.

PLANT:

PR NO.
ECN NO.

POWER SUPPLY
DATA SHEET NO. R

0 0 7 2

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 "[illegible]," 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.

---

1. Requires completion of Form TVA 10581-31 (see B31.0).

Line 22 - ADJ ALARM--Mark "yes" if an adjustable alarm feature is required; mark "no" otherwise.

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 1E (line 4) refer to paragraph B30.0 before completing this form.

Line 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 29 - SHIELDING--Mark "yes" if electrical shielding is required, "no" if not or "MS."

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 accomodate listing more than one vertical scale indicator 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.

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.

TVA 10581-20 (EN DES-2-84)

REQUISITION NO.

GENERAL	1	ITEM NO.		CHARACTERISTICS	21	ADJ LAG FEATURE	( )YES ( )NO
	2	QUANTITY			22	ADJ ALARM	( )YES ( )NO
	3	INSTRUMENT NO.			23	BCD OUTPUT	( )YES ( )NO
	4	IEEE CLASS	( )E ( )NA		24	BURDEN DATA	
	5	SEISMIC CATEGORY	( )1 ( )1(L) ( )NA		25	AMBIENT TEMP	
	6	ORIENTATION			26		
	7	MANUFACTURER			27	EXT SENSOR	
	8	MODEL NO.			28	INPUT IMPED	
	9	CASE STYLE/MATL			29	SHIELDING	
	10	ENCLOSURE			30	VOLTAGE TO GND	
	11	MOUNTING			31		
	12	UNIT WEIGHT			32		
	13	CONDUIT CONN			33	OVERRANGE CAP.	
	14	ELEC CONN			34		
	15	INTERNAL ILLUM	( )YES ( )NO		35		
	16	DISPLY TYPE	( )ANALOG( )DIGITAL		36		
	17	SCALE LENGTH			37	SPAN ADJ	
	18	MIN RESOLUTION			38	ZERO ADJ	
	19	DIGIT TYPE/SIZE	( )LED( )LCD SIZE:		39	VIBRATION	
	20	BRIGHTNESS CNTL	( )YES ( )NO		40		

ITEM NO.	INSTRUMENT NO.	QTY	SCALE LEGEND	RANGE	SCALE TYPE	INPUT SIGNAL	RE-MARKS	MODEL BID	UNIT PRICE

X - DATA BY BIDDER
* - OR EQUAL
NA - NOT APPLICABLE
MS - MFR STANDARD

DSGNR: DATE:
CHKR: DATE:

NOTE: (1)

SPECIFICATION NO.

PLANT:

PR NO.
ECN NO.

ELECTRICAL INDICATORS
DATA SHEET NO. R

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.

Line 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 "NS."

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 "NS."

Columns - The columns can accomodate 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.

INSTRUMENT NO--Enter the unique identification (UNID) number. Mark all TI's and matching TW's.

QTY--Enter the quantity of assemblies with this number.

TEMP RANGE--Enter the required temperature range, such as 30 to 130 F.

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 10581-21 (EN DES-2-84)

REQUISITION NO. _____

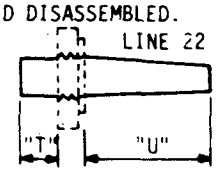
	GENERAL	1	ITEM NO.			21	WELL TYPE	( ) STRAIGHT ( ) TAPERED
		2	QUANTITY			22	EXTERNAL THD	
		3	INSTRUMENT NO.			23		
		4				24	INTERNAL THD	
		5	SEISMIC CATEGORY	( )1(L)	( )NA	25	DIMENSION "U"	
		6	ASME CODE CLASS		( )NA	26	DIMENSION "T"	
		7	MANUFACTURER			27	OTHER DIM.	
		8	MODEL NO.			28		
		9				29		
		10				30	WS MATL	
		11				31	DIAL	
		12				32	ELEMENT TYPE	
		13				33		
		14	DESIGN PRESS.			34		
		15	FLUID			35		
		16				36	ACCURACY	
		17				37	% OVERRANGE	
		18				38	REPEATABILITY	
		19				39		
		20				40	VIBRATION EFF	

ITEM NO.	INSTRUMENT NO.	QTY	TEMP RANGE	FLUID VELOCITY	REMARKS	MODEL BID	UNIT PRICE

X - DATA BY BIDDER
* - OR EQUAL
NA - NOT APPLICABLE
MS - MFR STANDARD
WS - WETTED SURFACE

M-5: DATE:
ENGR: DATE:

NOTES: (1) THERMOMETERS (MARK "TI-...," ETC.) SHALL MATE WITH AND FIT IN THE SEPARABLE WELL (MARK "TW-...," ETC.)
(2) MATING TI AND TW TO BE SHIPPED DISASSEMBLED.



SPECIFICATION NO.
BIMETAL THERMOMETERS AND MATING WELLS DATA SHEET NO.

PLANT:

0 0 7 9

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.

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 fill 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 19 - GASKET MATL--Mark "MS" or list the special material that would be required.

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.

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 36 - TANK CONN--Enter tank or vessel connection size and type, such as 3/4" male.

Line 37 - GLASS--List type of glass required, high pressure or tempered borosilicate.

Line 38 - ILLUMINATOR--Mark "yes" if an illuminator is required; if not required, mark "no."

Line 39 - PROTECTOR--Mark "yes" if protector is required; if not required, mark "no."

Columns - The columns can accomodate 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.

TVA 10581-22 (EN DES-2-84)

REQUISITION NO.

	GENERAL	1	ITEM NO.			21	VALVE BODY
		2	QUANTITY			22	VALVE BONNET
		3	INSTRUMENT NO.			23	VALVE HANDLE
		4				24	END CONN
		5	SEISMIC CATEGORY	( ) 1(L) ( ) NA		25	VALVE TRIM
		6	ASME CODE CLASS	( ) NA		26	SAFETY CHECK
		7	MANUFACTURER			27	
		8	MODEL NO.			28	
		9				29	
		10				30	
		11	MOUNTING			31	GAUGE TYPE
		12	UNIT WEIGHT			32	
		13				33	GAUGE CONN
		14	FLUID			34	DRAIN
		15	MAX PRESS.			35	VENT
		16	MAX TEMP			36	TANK CONN
		17				37	GLASS
		18	BODY MATL			38	ILLUMINATOR
		19	GASKET MATL			39	PROTECTOR
		20	AMBIENT TEMP			40	

ITEM NO.	INSTRUMENT NO.	QTY	BODY LENGTH	VIS LENGTH	CONN CENTERS	REMARKS	MODEL BID	UNIT PRICE

X - DATA BY BIDDER
• - OR EQUAL
NA - NOT APPLICABLE
MS - MFR STANDARD

NOTES: (1) EACH GAUGE GLASS TO BE SUPPLIED WITH TWO GAUGE COCKS (COMPLETE WITH SAFETY CHECKS) AND NIPPLES.

DSGNR: DATE:
CHKR: DATE:

SPECIFICATION NO.

PLANT:

PR NO.

ECN NO.

LIQUID LEVEL GAUGES
DATA SHEET NO.

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 watts. This would usually be listed by the bidder.

Line 18 - ELEC CONN--Enter the type electrical connections desired, such as 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 1E (line 4) refer to section B30.0 before completing this form.

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1. Requires completion of form TVA 10581-31 (see B31.0).

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 42 - REMOTE AMPL--Mark "yes" if the amplifier is required, "no" if it is not.

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 concern enter "MS."

Line 50 - OUTPUT SIGNAL--Enter the required output signal, such as 4 to 20mAdc.

Columns - The columns can accomodate 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 10581-23 (EN DES-2-84) REQUISITION NO. _____

	GENERAL	1	ITEM NO.			26		
		2	QUANTITY			27		
		3	INSTRUMENT NO.			28		
		4	IEEE CLASS	( )1E ( )NA		29		
		5	SEISMIC CATEGORY	( )1 ( )1(L) ( )NA		30		
		6				31		
		7	MANUFACTURER			32		
		8	MODEL NO.			33		
		9	CASE STYLE/MATL			34		
		10	ENCLOSURE			35		
		11	MOUNTING			36		
		12	UNIT WEIGHT			37	OUTPUT/GRD ISOL	
		13	CONDUIT CONN			38		
		14	POWER SUPPLY			39		
		15				40	RESPONSE TIME	
		16				41	PULSE DAMPING ADJ	( )YES ( )NO
		17	POWER REQ			42	REMOTE AMPL	
		18	ELEC CONN			43		
		19	PROCESS CONN			44	SPAN ADJ	
		20	WS PARTS MATL			45	ZERO ADJ	
		21	OVERRANGE PROT			46		
		22	VIBRATION			47		
		23				48	LOAD IMPD RANGE	
		24				49		
		25	AMBIENT TEMP			50	OUTPUT SIGNAL	

ITEM NO.	INSTRUMENT NO.	QTY	PRESS. RANGE	DESIGN PRESS.	REMARKS	MODEL BID	UNIT PRICE

X---DATA BY BIDDER
*---OR EQUAL
NA--NOT APPLICABLE
MS--MFR STANDARD
WS--WETTED SURFACE

DSGNR: DATE:
CHKR: DATE:

NOTES: (1)

	SPECIFICATION NO.
	PRESSURE
PR NO.	TRANSMITTER (ELECTRONIC)
ECN NO.	DATA SHEET NO.

PLANT:

0 0 8 5

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 box 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" lead 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 1E (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 1E (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.

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.

Line 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.

Columns - The columns can accomodate listing more than one solenoid valve per page.

ITEM 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.

FAIL POSIT--Designate the position of the valve upon power failure.

END CONN--Designate the type of end connection such as 1/4" NPTF.

C_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.

(1) 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 10581-24 (EN DES-2-84)

REQUISITION NO.

GENERAL		DESIGN	
1 ITEM NO.		21 BODY MATL	
2 QUANTITY		22 INS PARTS MATL	
3 INSTRUMENT NO.		23 COIL INS	
4 IEEE CLASS	( )1E ( )NA	24 DUTY CYCLE	
5 SEISMIC CATEGORY	( )1 ( )1(L) ( )NA	25 DISC MATL	
6 ASME CODE CLASS	( )NA	26 SEAT MATL	
7 MANUFACTURER		27 LEAKAGE	
8 MODEL NO.		28 ADJ FLOW	
9 SERVICE		29 MAN OVERRIDE	
10 ENCLOSURE/MATL		30 PILOT OPER	
11 MOUNTING		31 LINE SIZE/SCHED	
12 UNIT WEIGHT		32 MAX LINE PRESS (PSIG)	
13 ANSI CLASS		33 RMT POSN IND	
14 CONDUIT CONN		34 CONTACT RATING	( )NA
15 ELEC CONN		35	
16 POWER SUPPLY		36 FLOWING MEDIA	
17 POWER REQ		37 FLOW RATE	MAX:
18 HEAT RISE		38 INLET PRESS (P1) (PSIA)	MAX: MIN:
19 RADIATION		39 PRESS DROP	MAX: MIN:
20 AMBIENT TEMP		40 MEDIA TEMP	MAX: MIN:

ITEM NO.	INSTRUMENT NO.	QTY	NO. OF PORTS	FAIL POSIT	END CONN	C_v	ORIFICE SIZE	REMARKS	MODEL BID	UNIT PRICE

X---DATA BY BIDDER
*---OR EQUAL
NA--NOT APPLICABLE
MS--MFR STANDARD
WS--WETTED SURFACE

NOTES: (1) SPECIAL CONDITION: $P_2 > P_1$, YES ☐ NO ☐
P_2 (PSIA) = , P_1 (PSIA) =

DSGNR: DATE:
CHKR: DATE:

SPECIFICATION NO.

PLANT:

PR NO.
ECN NO.

SOLENOID VALVES
DATA SHEET NO.

0 0 8 9

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.

Line 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 O-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.

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 alarm is not required.

Line 33 - 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 accomodate listing more than one rotameter per page.

ITEM NO.--This is the contradt 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.

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 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.

TVA 10581-25 (EN DES-2-84)

REQUISITION NO. [redacted]

GENERAL	1	ITEM NO.			21	SCALE LENGTH	
	2	QUANTITY			22	ACCURACY	
	3	INSTRUMENT NO.			23	FLOAT/MATL	
	4				24	FLOAT STOPS	
	5	SEISMIC CATEGORY	( )1(L) ( )NA		25	SEALS/MATL	
	6	ASME CODE CLASS			26	PROT SHIELD	
	7	MANUFACTURED			27	INLET VALVE	
	8	MODEL NO.			28	OUTLET VALVE	
	9	CASE STYLE/MATL			29	VALVE BODY	
	10				30	VALVE SEAT	
	11	MOUNTING			31	ALARM SW RATING	
	12	UNIT WEIGHT			32	ALARM SW DIFF	
	13				33	REPRODUCIBILITY	
	14	PIPE CONN/MATL			34	ELEC CONN	
	15	FRAME STYLE			35	CONDUIT CONN	
	16	MULTI TUBE PNL			36		
	17	MANIFOLD CONN			37	RGLTR BODY	
	18	WS MATL			38	RGLTR DIAPH	
	19				39	RGLTR TRIM	
	20	AMBIENT TEMP			40	RGLTR TUBING	

ITEM NO.	INSTRUMENT NO.	QT	CAPACITY FLOW	CAPACITY UNITS	DIFF PRESS.	SERVICE TEMP	SERVICE PRESS.	MODEL BID	UNIT PRICE

X---DATA BY BIDDER
*---OR EQUAL
NA--NOT APPLICABLE
MS--MFR STANDARD
WS--WETTED SURFACE

DSGNR: DATE:
CHKR: DATE:

NOTES: (1)

SPECIFICATION NO.

PLANT:

PR NO.

ECN NO.

ROTAMETERS

DATA SHEET NO. R

0 0 4 3

B26.0 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 minimum 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 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--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.

Line 30 - ROTATABLE HEAD--Mark "yes" if required, "no" or "MS" if not.

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 33 - OUTPUT GAUGE--Mark "yes" if output 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 form 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.

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 - SPAN ADJ--Enter the minimum span adjustment as a percent if required, "no" if it is not.

Line 69 - ZERO ADJ--Mark "yes" if zero adjustment is 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--Most controllers are reversible in the field. Delete if it is not 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 (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.

0 0 4 6

Columns - The columns can accomodate 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 10581-26 (EN DES-2-84) REQUISITION NO. _____

GENERAL	1	ITEM NO.				41
	2	QUANTITY				42
	3	INSTRUMENT NO.				43
	4					44
	5	SEISMIC CATEGORY	( )I(L) ( )NA			45
	6	ASME CODE CLASS	( )NA			46
	7	MANUFACTURER				47
	8	MODEL NO.				48
	9	CASE STYLE/MATL				49
	10	ENCLOSURE				50
DESIGN	11	MOUNTING		DISPLACER DIA		51
	12	CASE LOCN	( )LEFT ( )RIGHT	DISPL LENGTH		52
	13	UNIT WEIGHT		DISPL MATERIAL		53
	14	APPLICATION		DISPL ROD LENGTH		54
	15			DISPL ROD MATL		55
	16	LIQUID				56
	17			TORQUE TUBE MATL		57
	18					58
	19	SYSTEM TEMP		COOLING EXTN		59
	20	AMBIENT TEMP				60
CAGE	21	BODY MATL		ACCURACY		61
	22			HYSTERESIS		62
	23	OPR PRESS. MAX-MIN		LINEARITY		63
	24	OPR TEMP MAX-MIN		REPEATABILITY		64
	25	SPGR AT OPR T-P		RESPONSE TIME		65
	26			SENSITIVITY		66
	27			SPAN ADJ		67
	28	UPPER CONN				68
	29	LOWER CONN		ZERO ADJ		69
	30	ROTATABLE HEAD	( )YES ( )NO ( )MS			70
ACCESSORIES	31	AIRSET	( )YES ( )NO	IN-OUT CONN		71
	32	SUPPLY GAUGE		CONTROL ACTION	REVERSIBLE	72
	33	OUTPUT GAUGE		SUPPLY AIR		73
	34	SUPPLY PRESS.		MODES		74
	35			MEAS INC-OUTPUT		75
	36			OUTPUT		76
	37	SWITCHES-FORM		PROP BAND ADJ (P)		77
	38			RESET ADJ (I)		78
	39	SW RATING		RATE ADJ (D)		79
	40	MEAS INC-CONTACT				80

MFR DATA (IF APP) | PRIMARY ELEMENT | PERFORMANCE DATA | CONTROL XMITR

ITEM NO.	INSTRUMENT NO.	QTY	RANGE OR SPAN	REMARKS	MODEL BID	UNIT PRICE

X---DATA BY BIDDER
*---OR EQUAL
NA--NOT APPLICABLE
MS--MFR STANDARD
WS--WETTED SURFACE

DSGNR: DATE:
CHKR: DATE:

NOTES:

SPECIFICATION NO.
DISPLACER TYPE (PNEUMATIC)
LEVEL CONTROLLER
DATA SHEET NO.

PLANT:

PR NO.
ECN NO.

0 0 9 8

B27.0 DISPLACER TYPE (ELECTRONIC) LEVEL CONTROLLER/TRANSMITTER (TVA-10581-27)[1]

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 - AMBIENT TEMP--Enter the ambient temperature limits of the area where the units will be mounted.

Line 21 - BODY MATL--Enter the cage 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.

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1. If a transmitter is specified, complete form TVA 10851-31 (see B31.0).

0 0 4 9

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.

Line 39 - SW RATING--List the switch rating, such as 4 amperes at 120V ac. This may required both minimum and maximum contact ratings in order 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 "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 mark whether or not air fin extension is required.

Line 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."

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 - 1Ø.

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 to 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.

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.

TVA 10581-27 (EN DES-2-84)

REQUISITION NO. _____

GENERAL	1	ITEM NO.				41	MFR DATA (IF APP)
	2	QUANTITY				42	
	3	INSTRUMENT NO.				43	
	4					44	
	5	SEISMIC CATEGORY	( )I (L) ( )NA			45	
	6	ASME CODE CLASS	( )NA			46	
	7	MANUFACTURER				47	
	8	MODEL NO.				48	
	9	CASE STYLE MATL				49	
	10	ENCLOSURE				50	
DESIGN	11	MOUNTING		DISPLACER DIA		51	PRIMARY ELEMENT
	12	CASE LOCN	( )RIGHT ( )LEFT	DISPL LENGTH		52	
	13	UNIT WEIGHT		DISPL MATERIAL		53	
	14	APPLICATION		DISPL ROD LENGTH		54	
	15			DISPL ROD MATL		55	
	16	LIQUID				56	
	17	OPR PRESS, MAX-MIN		TORQUE TUBE MATL		57	
	18	OPR TEMP MAX-MIN				58	
	19	SPGR AT OPR T-P		COOLING EXT		59	
	20	AMBIENT TEMP				60	
CAGE	21	BODY MATL				61	PERFORMANCE DATA
	22	ANSI RATING		HYSTERESIS		62	
	23	SYSTEM TEMP				63	
	24					64	
	25			RESPONSE TIME		65	
	26					66	
	27			POWER CONSUMPTION		67	
	28	UPPER CONN				68	
	29	LOWER CONN		SPAN ADJ		69	
	30	ROTATABLE HEAD		ZERO ADJ		70	
ACCESSORIES	31			FUNCTION	( )TRANS ( )CNTLR	71	CONTROL-XMITR
	32			CONTROL ACTION	REVERSIBLE	72	
	33			SUPPLY VOLTAGE		73	
	34	GAUGE GLASS		MODES		74	
	35			MEAS INC-OUTPUT		75	
	36	SEPARATE JCT BOX		OUTPUT		76	
	37	SWITCHES-FORM		PROP BAND ADJ (P)		77	
	38	SW ENCLOSURE	NEMA	RESET ADJ (I)		78	
	39	SW RATING		RATE ADJ (D)		79	
	40	MEAS INC-CONTACT				80	

ITEM NO.	INSTRUMENT NO.	QTY	RANGE OR SPAN	REMARKS	MODEL BID	UNIT PRICE

X---DATA BY BIDDER
*---OR EQUAL
NA--NOT APPLICABLE
MS--MFR STANDARD
WS--WETTED SURFACE

M-6: DATE:
M-5: DATE:
ENGR: DATE:

NOTES: (1)

PLANT:

SPECIFICATION NO.
DISPLACER TYPE (ELECTRONIC)
LEVEL CONTROLLER/TRANSMITTER
DATA SHEET NO.

0 1 0 3

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.

Line 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 1E (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 to 20mAdc.

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).

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.

TVA 10581-28 (EN DES-2-84)

REQUISITION NO. _____

GENERAL	1	ITEM NO.				31	MFR DATA (IF APP)
	2	QUANTITY				32	
	3	INSTRUMENT NO.				33	
	4	IEEE CLASS	( )1E ( )NA			34	
	5	SEISMIC CATEGORY	( )1 ( )1(L) ( )NA			35	
	6					36	
	7	MANUFACTURER				37	
	8	MODEL NO.				38	
	9	CASE STYLE/MATL				39	
	10	ENCLOSURE				40	
DESIGN	11	MOUNTING		INPUT/OUTPUT ISOL		41	FEATURES
	12	UNIT WEIGHT		LOW-LEVEL CUTOFF		42	
	13			OVERRANGE PROT		43	
	14			POWER CORD		44	
	15	CONDUIT CONN				45	
	16	ELEC CONN		TEST JACKS		46	
	17	SUPPLY VOLT/FREQ				47	
	18	TRANS PWR SUPPLY	( )YES ( )NO			48	
	19	TRANS PWR VOLTS	( )NA			49	
	20	AMBIENT TEMP				50	
CHARACTERISTICS	21	INPUT SIGNAL				51	PERFORMANCE DATA
	22					52	
	23	OUTPUT SIGNAL				53	
	24	LOAD IMPEDANCE				54	
	25	POWER CONSUMPTION				55	
	26					56	
	27					57	
	28					58	
	29					59	
	30	VIBRATION				60	

ITEM NO.	INSTRUMENT NO.	QTY	REMARKS	MODEL BID	UNIT PRICE

X---DATA BY BIDDER
•---OR EQUAL
NA--NOT APPLICABLE
MS--MFR STANDARD

NOTES: (1)

DSGNR: DATE:
CHKR: DATE:

SPECIFICATION NO.	
SQUARE ROOT	
CONVERTER	
DATA SHEET NO.	R

PLANT:

PR NO.
ECN NO.

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.

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 accomodate listing more than one limit switch per page.

ITEM NO.--Will be filled out by procurement engineer.

INSTRUMENT NO.--Enter UNID number of switch.

QTY--Enter number of switches with the same instrument number.

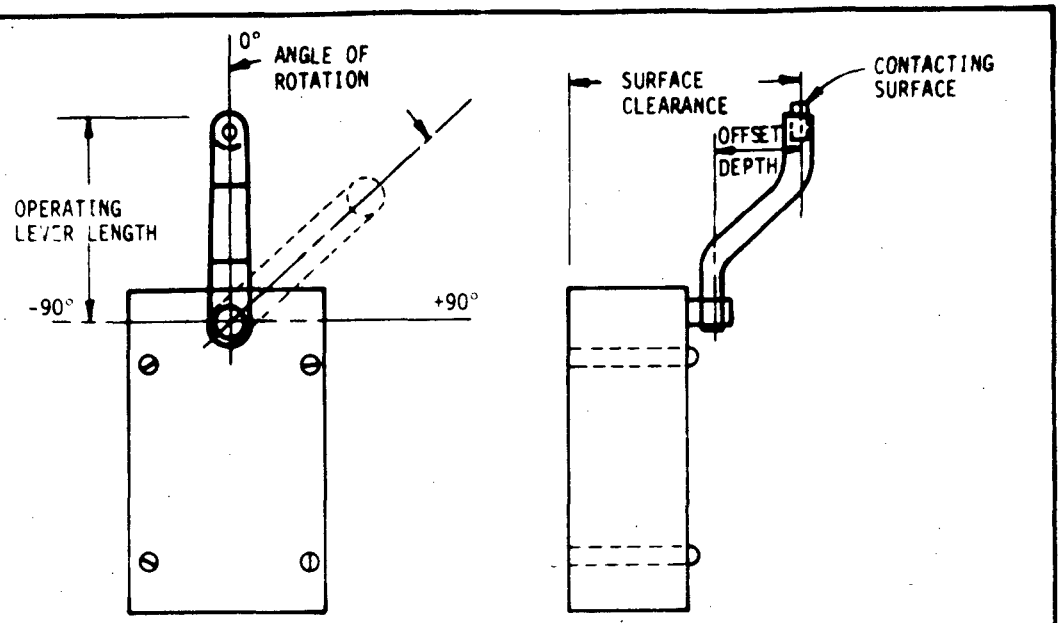
SWITCH - QTY--Enter the quantity of contact sets required.

SWITCH - TYPE--Enter the form of switch (SPDT, DPDT, etc.).

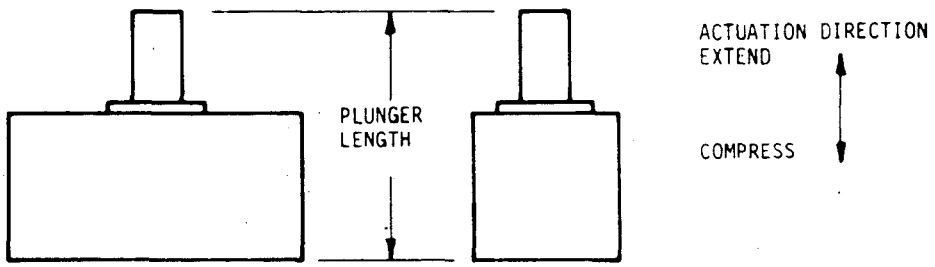
SWITCH - VOLTS--Enter the voltage rating for the switch.

SWITCH - AMPS--Enter the amperage rating for the switch.

REMARKS--Enter any additional requirements using footnotes if necessary.



ROTARY-TYPE
LIMIT SWITCH



PLUNGER-TYPE
LIMIT SWITCH

FIGURE B29-1

LIMIT SWITCH TERM DEFINITIONS

TVA 10581-29 (EN DES-2-84)

REQUISITION NO.

GENERAL	1	ITEM NO.		23	ROTARY TYPE ONLY		
	2	QUANTITY		24		OPRG DIRECTION ( )CW ( )CCW	
	3	INSTRUMENT NO.		25		NON ACT POSN	
	4	IEEE CLASS	( )1E ( )NA	26		OPRG POSN	DEG
	5	SEISMIC CATEGORY	( )1 ( )1(L) ( )NA	27		OVERTRAVEL	DEG
	6			28			
	7	MANUFACTURER		29		OPRG LEVER LG	
	8	MODEL NO.		30		SURFACE CLEAR	
	9	CASE STYLE/MATL		31		OFFSET DEPTH	
	10	ENCLOSURE		32			
	11	MOUNTING		33			
	12			34			
	13	TYPE	( )ROTARY ( )PLUNGER	35			
	14	ACTION	( )MAINTAIN ( )SPG RET	36			
	15	OPRG TORQUE/PRESS		37			
	16	CONTACTING SURF.		38			
	17			39			
PLUNGER TYPE	18	ACT DIRECTION	( )EXTEND ( )COMPRESS	40			
	19	PLUNGER LG		41			
	20	PLUNGER TRAVEL		42			
	21	PLUNGER OVERTRAVEL		43			
	22			44			

	ITEM NO.	INSTRUMENT NO.	QTY	SWITCH QTY	SWITCH TYPE	SWITCH VOLTS	SWITCH AMPS	REMARKS
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								

X---DATA BY BIDDER
*---OR EQUAL
NA--NOT APPLICABLE
MS--MFR STANDARD

DSGNR: DATE:
CHKR: DATE:

NOTES: (1)

SPECIFICATION NO.

PLANT:

PR NO.
ECN NO.

LIMIT SWITCHES
DATA SHEET NO.

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.

Line 14 - ABNORMAL - TEMPERATURE--Enter the abnormal ambient operating condition (include units).

Line 15 - ABNORMAL - PRESSURE--Enter the abnormal ambient 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.

Line 19 - ABNORMAL - NONOPERATE SUBMERGED--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.

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 OPRGTIME(1)--Enter the length of time after the beginning of the accident that the device must operate (in minutes, hours, days).

Line 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.

TVA 10581-30 (EN DES 2-84)

REQUISITION NO. _____

1	ITEM NO.					
2	INSTRUMENT NO.					
3						
4						
5						
6	NORMAL	TEMPERATURE				
7		PRESSURE				
8		HUMIDITY				
9		RADIATION				
10		DUST	( )YES ( )NO	( )YES ( )NO	( )YES ( )NO	( )YES ( )NO
11						
12						
13						
14	ABNORMAL	TEMPERATURE				
15		PRESSURE				
16		HUMIDITY				
17		RADIATION				
18		OPERATE SUBMERGED	( )YES ( )NO	( )YES ( )NO	( )YES ( )NO	( )YES ( )NO
19		NON-OPERATE SUB	( )YES ( )NO	( )YES ( )NO	( )YES ( )NO	( )YES ( )NO
20		DEPTH				
21	ACCIDENT	TEMPERATURE				
22		PRESSURE				
23		HUMIDITY				
24		RADIATION DOSE				
25		MAX RAD DOSE RATE/TIME				
26		CAUSTIC SPRAY	( )YES ( )NO	( )YES ( )NO	( )YES ( )NO	( )YES ( )NO
27		OPRG TIME (1)				
28		SUBMERGENCE DEPTH				
29		REQ'D ACCURACY				
30						

ITEM NO.: INSTRUMENT NO.:

FUNCTION:

REMARKS:

CAUSTIC SPRAY COMPOSITION:

NOTES: (1) OPERATING TIME IS TIME AFTER THE BEGINNING OF THE ACCIDENT

DSGNR: DATE:

CHKR: DATE:

SPECIFICATION NO.
ENVIRONMENTAL CONDITIONS
FOR CLASS 1E EQPT
DATA SHEET NO. SHEET R

PLANT:

PR NO.

ECN NO.

0 1 1 4

TVA 10581-30a (EN DES 2-84) REQUISITION NO.

ITEM NO. INSTRUMENT NO.:

FUNCTION:

REMARKS:

ITEM NO.: INSTRUMENT NO.:

FUNCTION:

REMARKS:

ITEM NO.: INSTRUMENT NO.:

FUNCTION.

REMARKS:

NOTES:

DSGNR: DATE:
CHKR: DATE:

	SPECIFICATION NO.
	ENVIRONMENTAL CONDITIONS
PR NO.	FOR CLASS 1E EQUIP CON'T
ECN NO.	DATA SHEET NO. SHEET R

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 shall 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--Enter the accuracy for the function. The specified accuracy must include accuracy from sensor to final device. This entry shall include a numerical value only. For trip functions, the accuracy should be specified in engineering units with the units entered in the "ACCURACY BASIS" column. For indication functions accuracy should be specified in percent-of-process-span with "__ % process span" listed in the "ACCURACY BASIS" column.

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."

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, annubars, 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.

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.

TVA 10581-31 (EN DES 2-84) REQUISITION NO. _____

LOOP SKETCH

NOTE: FM=FIELD MOUNTED, AIR=AUXILIARY INSTRUMENT ROOM, MCR=MAIN CONTROL ROOM

PROCESS RANGE/
SIGNAL

FUNCTION NO.	FUNCTION	FINAL DEVICE	ACCURACY	ACCURACY BASIS	ACCURACY RANGE	
1						
2						
3						
4						
5						
6						
7						
8						
9						

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.	MANUFACTURER	MODEL NO.	INPUT SIGNAL	INPUT IMPED	OUTPUT SIGNAL	ACCURACY	ACCURACY BASIS	

POWER SUPPLIES (THIS SECTION WILL BE COMPLETED ONLY IF AN EXISTING POWER SUPPLY WILL BE USED)

INST NO.	MANUFACTURER	MODEL	RATING		VOLTAGE REGULATION	
			VOLTAGE	CURRENT		

*---OR EQUAL
NA--NOT APPLICABLE
MS--MFR STANDARD
EX--EXISTING EQUIPMENT
N---NEW
DSGNR: DATE:
CHKR: DATE:

NOTES: (1)

SPECIFICATION NO.
LOOP DATA

PLANT:

PR NO.
ECN NO.

DATA SHEET NO.

0 1 1 9

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 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: (1a) ineffective handling of the interface region between two analyses and (1b) 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. R C Cruise 3/15/84 Task Force Concurrence D L Lamm 3/16/84

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

(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 WBN unit 1. (2) No further evaluation is required, see 3.B.(2) above.

(1a, 1b) 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. R C Cruise 3/15/84 Task Force Concurrence D L Lamm 3/16/84

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

(1a, 1b) The licensing basis for these findings is not satisfied. (2) Licensing basis is satisfied.

Resp. Org. R Cunin 3/15/84 Task Force Concurrence W Lyon 3/16/84

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 Sheet, page 7.)

Resp. Org. R Cunin 3/15/84 Task Force Concurrence W Lyon 3/16/84

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 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. R Cunin 3/15/84 Task Force Concurrence W Lyon 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. R. Cruise 3/15/84 Task Force Concurrence W. Gunn 3/16/84

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. R. Cruise 3/15/84 Task Force Concurrence W. Gunn 3/16/84

10A. Identification of Corrective Action for Future Work

A. Preliminary

B. Final

The action identified in 9A.B appears to be adequate.

Resp. Org. R. Cruise 3/15/84 Task Force Concurrence W. Gunn 3/16/84

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. Final

Refer to 9A.B.

Resp. Org. R Cuming 3/15/84 Task Force Concurrence W H Jones 3/16/84

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 27, 1984 (QMS 841127 200).

Resp. Org. J W von Weisenstein 11/30/84 Task Force Concurrence W H Jones 12/31/84

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

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.

TVA 84 (08-9-88)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

QMS '841127 200

8411290345

TO : Quality Management Staff Files

FROM : J. W. von Weisenstein, 384 SPB-K

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."

J. W. von Weisenstein

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, W11A9 C-K
MEDS, W5B63 C-K

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

2078

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
CATEGORY: 6

Prepared By: [signature] Jordan
Date: 11/26/84

Approved By: [signature]
Date: 11.26.84

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 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).

02530

[redacted] [redacted]

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.

02530

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. Documents Reviewed:

Design Calculations

1. N3-3-4A
2. N3-3-13A
3. N3-3-14A
4. 0600200-02-05
5. 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
4. NCR WBNCEB8232
5. NCR WBNCEB8233
6. NCR WBNSWP8309
7. NCR WBNSWP8312

Engineering Change Notice

ECN 3511

V. List of Personnel Contacted:

Name	Title	Organization
R. W. Griffith	Mechanical Engineer	OE-MEB-WDEP
D. C. Phung	Civil Engineer	OE-CEB

VI. Scoping Document (Attached)

02530

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
CATEGORY: 6

Prepared By: L.E. Brock/sec
Date: 9/20/84

Approved By: [signature]
Date: 9.20.84

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.

02530

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

CEB '82 1117 022

1 REPORT NO. WBNCEB8233

2 PLANT Watts Bar | 3 UNIT 1

4 PREPARER/ORGANIZATION/DATE G. G. Wagner/TPE-CEB-PAS2/11-9-82

5 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.

8402270150 (2)

6 DATE OF OCCURRENCE EST (X), ACT. ( ) 1/80

7 METHOD OF DISCOVERY Black & Veatch Review

8 UNID CODE (EN DES-EP 8.01)

9 SIGNIFICANT CONDITION ADVERSE TO QUALITY YES [X] NO [ ]

10 *BRANCH CHIEF/DATE 11/12/82

11 CORRECTIVE ACTION: GENCEB8302 was written to address an error in the anchor program. As a result of this generic NCR, all anchor loads on WBN will be rerun and documented. Therefore, the above-stated deficiency will have the anchors recalculated in accordance with the revised anchor program.

12 CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES [ ] NO [ ]

13 DESIGN CRITERIA DOCUMENT NO. EXCEPTION REQUEST NO.

14 ECN REQUIRED [X] YES NO [ ] ECN NO. 3511 | 15 SCHEDULE IMPACT [ ] P [ ] A [ ] N

17 ASSIGNABLE CAUSE: (REQUIRED IF SIGNIFICANT) Microfilming of the anchor program printouts was not a requirement of the analyst. As a result, calculations to support the anchor load tables were not always readily available.

17 THIS IS A GENERIC CONDITION YES ☐ NO ☐

18 ACTION REQUIRED TO PREVENT RECURRENCE: (REQUIRED IF SIGNIFICANT) All anchors on WBN will be recalculated and documented. The anchor program printouts will be microfilmed and filed according to the following criteria·

1. If both sides of the anchor are rigorously analyzed, the microfilmed anchor load printout will be filed with the analysis problem that was last reanalyzed.
2. If one side of the anchor is alternately analyzed and the other side is rigorously analyzed, the microfilmed anchor load printout will be filed with the rigorously analyzed side.
3. If one side of the anchor is CEB alternately analyzed and the other side is rigorously analyzed, anchor loads will be tabulated for both sides on separate tables. Documentation for the loads on that analysis are microfilmed and referenced in the respective problem. Documentation EN DES-EP 3.56 will have a section concerning the documentation and microfilming of anchor loads.

19 *QA ENGINEER REVIEW AND CONCURRENCE: JEMcCord 11/4/83 11/7/83

20 LABOR EST. ( ), ACT. ( ) MH | 21 SCHEDULE EST. ( ), ACT. ( ) DAY

22 ACTIVITY NO. | 23 TASK DESCRIPTION | 24 DATE INITIATED

25 REMARKS:

This NCR is superceded by NCR WBNCEB8233 R1, MEDS accession number CEB 831229 009.

27 DISTRIBUTION:
28 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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26 ALL EN DES ACTION COMPLETE: JAE *BRANCH CHIEF/ORG. 2/9/84 DATE

CEB 840209 008

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

MEDS Accession No SWP '83 0125 178

[1] REPORT NO WBNSWP8309

[2] PLANT WATTS BAR NUCLEAR PLANT	[3] UNIT 1
[4] PREPARER-ORGANIZATION/DATE R. L. Ilich/SWP/January 25, 1983	

[5] DESCRIPTION OF CONDITION

Box anchors 47A060-3-8 and 47A060-3-10 fail to meet the stiffness requirements for the force in the z-direction as required by Design Criteria WB-DC-40-31.15, section 7.1.4. Revision 1 of 47A060-3-8 allows 25.8 percent 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, to be transferred through the anchor to the other side. Section 7.1.4 of the design criteria limits a load transferred through anchor to 10 percent.

840420E0248 (3)

[6] DATE OF OCCURRENCE ESTIMATED [X] ACTUAL [ ] 12/8/80	[9] SIGNIFICANT CONDITION ADVERSE TO QUALITY YES [X] NO [ ]
METHOD OF DISCOVERY Black & Veatch Findings F-319 & F-324	[10] *BRANCH CHIEF DATE JC Stardy 1-25-83
[8] UNID CODE (EN DES EP 8.01) 47	

[11] CORRECTIVE ACTION

Box anchors 47A060-3-8 and 47A060-3-10 were redesigned under ECN 3511 to meet the stiffness requirements of design criteria WB-DC-40-31.15, section 7.1.4.

[12] CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES [ ] NO [X]	
[13] DESIGN CRITERIA DOCUMENT NO N/A	EXCEPTION REQUEST NO N/A
[14] ECN REQUIRED [X] YES [ ] NO 3511	[15] SCHEDULE IMPACT [ ] P [ ] A [X] N

NONCONFORMANCE REPORT

[1] REPORT NO WBNSWP8309

[16] ASSIGNABLE CAUSE (REQUIRED IF SIGNIFICANT)

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.

[17] THIS IS A GENERIC CONDITION YES [ ] NO [X]

[18] 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.

[19] *INDEPENDENT REVIEW M. L. Maxwell 4/20 Rev

[20] LABOR EST ( ), ACT ( ) N/A MH [21] SCHEDULE EST ( ), ACT ( ) N/A DAYS

[22] ACTIVITY NO N/A [23] TASK DESCRIPTION N/A [24] DATE INITIATED N/A

[25] REMARKS

Additional corrective action by CONST is being tracked by ECN 3511.

[27] DISTRIBUTION
CONST PROJECT MANAGER R. L. Ilich, 375 GB-K
[28] 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
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[26] ALL EN DES ACTION COMPLETE

C A Chandler 4-6-84
*BRANCH CHIEF/ORG. DATE

MEB 840409 016
MEDS ACCESSION NO.

EN DES
NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

NCR NO. WBNSWP8309

SIGNIFICANT
YES ☒ NO ☐

REPORTABLE
YES ☐ NO ☒

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 ☒ No ☐ If yes, list in (C) below.

C. Documents related to the NCR (ECN, analyses, memos, contract No., etc.)

	REF OR MEDS ACCESS. NO.	COMPLETION DATE
ANCHOR DRAWING	47A060-3-8 R2	8/10/83
47A060-3-8 ANCHOR CALCS	WBP840123050	1/23/84
ANCHOR DRAWING	47A060-3-10 R3	8/10/83
47A060-3-10 ANCHOR CALCS	WBP840123017	1/23/84
REQUIREMENTS NOTIFICATION MEMO	WBP840213021	2/13/84
ECN 3511 CLOSURE SHEET	WBP840321526	3/21/84

D. Is action by organization outside EN DES required? Yes ☒ No ☐
Organization tracking No. ECN 3511

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 ☒ No ☐

G. Remarks:

Verified By Robert L. Illick Date 4/2/84

TVA 10700A (EN DES--12/83)

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

MEDS Accession No. SWP 83 0209 047

[1] REPORT NO WBNSWP8312

[2] PLANT WATTS BAR NUCLEAR PLANT [3] UNIT 1

[4] PREPARER/ORGANIZATION/DATE J. R. Holloway/SWP/February 9, 1983

[5] 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 (lbs 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 (3)

[6] DATE OF OCCURRENCE EST ( ) ACT (X) 12/10/80

[7] METHOD OF DISCOVERY Black & Veatch Rev (F-325)

[8] UNID CODE (EN DES-EP 8.01) N/A

[9] SIGNIFICANT CONDITION ADVERSE TO QUALITY YES [ ] NO [X]

[10] *BRANCH CHIEF/DATE JC Stardifer 2/9/83

[11] CORRECTIVE ACTION
Calculations were redone using correct applied forces. No further action is necessary.

[12] CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES [ ] NO [X]

[13] DESIGN CRITERIA DOCUMENT NO. EXCEPTION REQUEST NO

[14] ECN REQUIRED [ ] YES NO [X] ECN NO

[15] SCHEDULE IMPACT [ ] P [ ] A [X] N

NONCONFORMANCE REPORT

[1] REPORT NO. WBNSWP8312

[16] ASSIGNABLE CAUSE (REQUIRED IF SIGNIFICANT)

N/A

[17] THIS IS A GENERIC CONDITION YES ☐ NO [X]

[18] ACTION REQUIRED TO PREVENT RECURRENCE (REQUIRED IF SIGNIFICANT)

N/A

[19] *INDEPENDENT REVIEW R. D. Pratt 1/5/84

[20] LABOR EST. ( ), ACT. ( ) MH [21] SCHEDULE EST ( ), ACT ( ) DAYS

[22] ACTIVITY NO	[23] TASK DESCRIPTION	[24] DATE INITIATED

[25] REMARKS

[27] DISTRIBUTION:
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[26] ALL EN DES ACTION COMPLETE:

*BRANCH CHIEF/ORG. DATE 4-24-84

MEB 840427 013

MEDS ACCESSION NO.

EN DES
NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

NCR NO. WBNSWP1312

SIGNIFICANT
YES ☐ NO ☒

REPORTABLE
YES ☐ NO ☒

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 ☐ No ☐ If yes, list in (C) below.

C. Documents related to the NCR (ECN, analyses, memos, contract No., etc.)

	REF OR MEDS ACCESS. NO.	COMPLETION DATE
SUPPORT CALCULATION (47A060-3-9)	WBP840305040	3/5/84
SUPPORT CALCULATION (47A060-3-11)	WBP840305041	3/5/84

D. Is action by organization outside EN DES required? Yes ☐ No ☒
Organization tracking No. _____

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 ☒ No ☐

G. Remarks:

Verified By _____ Date 3/5/84

TVA 10700A (EN DES--12/83)

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

CER '82 1129 001

[1] REPORT NO. WBNCEB8232

[2] PLANT Watts Bar

[3] UNIT S 1 and 2

[4] PREPARER/ORGANIZATION/DATE C. G. Wagner/TPE-CEB-PAS2/11-9-82

[5] DESCRIPTION OF CONDITION

The support design load of 1850 pounds indicated on document 47B427-470R1 for the variable spring at node 133 is inaccurate. Analysis problems N3-3-4A and 0600200-02-05 have an overlap region with the inclusion of node 133. Neither analysis confirms nor is within 10 percent of the recorded support design value. The NCR was caused probably while transposing numbers from the computer printout to the support load table and was not caught by the checker.

8404068U912 (3)

[6] DATE OF OCCURRENCE EST (X), ACT. ( ) 1/82

[7] METHOD OF DISCOVERY Black & Veatch Review

[8] UNID CODE (EN DES-EP 8.01)

[9] SIGNIFICANT CONDITION ADVERSE TO QUALITY YES ☐ NO ☒

[10] *BRANCH CHIEF/DATE 11/22-82 11/23/82 11/30/82

[11] CORRECTIVE ACTION:

An evaluation of the deficiency exposed improper lapping techniques used in problem 0600200-02-05. The analysis was reanalyzed following the WBN Rigorous Analysis Handbook, section 200, which explains proper lapping techniques. The work was performed under ECN 3511.

[12] CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES ☐ NO ☒

[13] DESIGN CRITERIA DOCUMENT NO. EXCEPTION REQUEST NO.

[14] ECN REQUIRED ☒ YES NO ☐ ECN NO. 3511

[15] SCHEDULE IMPACT ☐ P ☐ A ☐ N

NONCONFORMANCE REPORT

[1] REPORT NO. 1

[16] ASSIGNABLE CAUSE: (REQUIRED IF SIGNIFICANT)

[17] THIS IS A GENERIC CONDITION YES ☐ NO ☐

[18] ACTION REQUIRED TO PREVENT RECURRENCE: (REQUIRED IF SIGNIFICANT)

[19] ~~QA ENGINEERING REVIEW AND CONCURRENCE~~ INDEPENDENT REVIEW: Donald W. Pipes 8-24-83

[20] LABOR EST. ( ), ACT. ( ) MH [21] SCHEDULE EST. ( ), ACT. ( ) DAYS

[22] ACTIVITY NO. [23] TASK DESCRIPTION [24] DATE INITIATED

[25] REMARKS:

[27] DISTRIBUTION:
[28] CONST PROJECT MANAGER
EN DES PROJECT MANAGER
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OEOC QA
NEB (for Significant NCR's)**
MEDB
NSRS (for Significant NCR's)

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[26] ALL EN DES ACTION COMPLETE:
JAE
*BRANCH CHIEF/ORG. 4/2/84 DATE

CEB'84 0402 003

EN DES
NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

NCR NO. WBNCEB8232

SIGNIFICANT
YES ☐ NO ☒

REPORTABLE
YES ☐ NO ☒

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 ☒ No ☐ If yes, list in (C) below.

C. Documents related to the NCR (ECN, analyses, memos, contract No., etc.)

	REF OR MEDS ACCESS. NO.	STATUS WORKING (see (F) below)	COMPLETE
ECN 3511	WBP840321526		✓

D. 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 ☒ 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 ☐

H. Remarks:

Verified By Roger Griffith Date 3-26-84

A32 850423 005

LPII /JWH
RIMS

KC: jh
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

APR 17 1985

GPD

Tennessee Valley Authority
ATTN: Mr. H. G. Parris
Manager of Power and Engineering
500A Chestnut Street Tower II
Chattanooga, TN 37401

L44 850423 142

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

GPD
JAR
JFC
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GRJ

B45 '85 0425 000

Enclosure:
Inspection Report Nos. 50-390/85-35
and 50-391/85-29

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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)

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APR 22 1985
MANAGER OF
POWER AND ENGINEERING

NEB MASTER FILE

SENT APR 29 1985

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: S. J. Vias 4/16/85
S. J. Vias Date Signed

Approved by: J. J. Blake 4/16/85
J. J. Blake, Section Chief Date Signed
Engineering Branch
Division of Reactor Safety

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

1. Persons Contacted

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 office personnel.

*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

a. (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 8a.(3). 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 0, 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. This item is now considered closed.

b. (Closed) Violation 390/85-18-01, "Improper Design of Pipe Support 47A496-5-14 R1". 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. The licensee has 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.

c. (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 the final results and formal report.

4. Unresolved Items

Unresolved items were not identified during the inspection.

5. Licensee Identified Items

a. (Closed) Item 390/85-10 and 391/85-10, "Design Errors of Drawing 47W491-8" (10 CFR 50.55(e)). WBNMEB8507 The final report was submitted on March 11, 1985. The report has been reviewed and determined to be acceptable. The inspector held discussions with responsible licensee representatives, reviewed supporting documentation and observed representative samples of work to verify that the corrective actions identified in the report have been completed.

b. (Closed) Item 390/85-12 and 391/85-13, "Failure to Identify A Water Spray Hazard" (10 CFR 50.55(e)). WBNMEB8509 The final report was submitted on March 22, 1985. The report has been reviewed and determined to be acceptable. The inspector held discussions with responsible licensee representatives, reviewed supporting documentation and observed representative samples of work to verify that the corrective actions identified in the report have been completed.

DISTRIBUTION SHEET FOR ENDORSEMENTS

PLANT(s) Watts Bar ITEM NO. Inspection Report 390/85-35 & 391/85-29

SUBJECT Routine Safety Inspection April 1→4, 1985 Inspector S. Vias

GENERAL NOTE/REFERENCE: no violations or deviations

Attachment

cc (Attachment):	Special Instr.
(X) A. P. Bianco	( )
( ) V. A. Bianco, A12 Sequoyah ENG	( )
( ) M. N. Bressler	( )
( ) R. H. Bryan	( )
( )( ) T. G. Chapman	( )
( ) L. H. Chin	( )
( ) R. F. Christie	( )
( ) D. T. Clift	( )
( ) R. A. Costner	( )
( ) J. F. Cox	( )
( ) W. L. Elliott	( )
(X) D. G. Fickey, WBN, Field Serv. Bldg, OE	( )
(+) Personal Attention	( )
( ) C. H. Gabbard	( )
( ) G. E. German	( )
( ) L. A. Haack	( )
( ) T. E. Haynes E1-BFN	( )
( ) P. G. Ioannides	( )
( ) R. M. Jessee	( )
( )(X) H. L. Jones	( )
( ) K. D. Keith	( )
( ) D. L. Kitchel	( )
( ) L. J. Klaes	( )
( ) F. A. Koontz	( )
( )( ) L. W. Lau	( )
( ) E. A. Merrick	( )
(X) P. D. Metcalf	( )
( ) H. E. McConnell	( )
( ) R. S. McKeehan	( )
( ) D. L. Michlink	( )
( ) H. G. O'Brien	( )
( ) L. D. Proctor	( )
( )(X) John A. Raulston	( )
( ) D. G. Renfro	( )
( ) C. E. Roberts	( )
( ) E. R. Taylor	( )
( )( ) R. C. Weir	( )
( ) B. K. Williams	( )
( ) D. L. Williams	( )
( ) Dan W. Wilson	( )
( ) _____	( )

AR: DJ2 APR 26 1985

c (Attachment):	Special Instr.
( ) E. G. Beasley, W12C61 C-K	( )
( ) W. R. Brown, 9-167 SB-K	( )
(X) C. Bonine, 12-108 SB-K	( )
( ) R. W. Cantrell, W12A12 C-K	( )
( ) R. W. Dibeler, 11-142 SB-K	( )
( ) G. F. Dilworth, W12A8 C-K	( )
( ) J. R. Lyons, W12D131 C-K	( )
( ) RIMS, SL26 C-K	( )
( ) R. M. Pierce, 9-169 SB-K	( )
( ) K. W. Whitt, E7B31 C-K	( )
( ) _____	( )
( ) _____	( )
( ) _____	( )
(X) R. O. Barnett, W9D224 C-K	( )
( ) N. R. Beasley, A10-BFN	( )
( ) F. W. Chandler, W8C126 C-K	( )
(X) C. A. Chandley, W7C126 C-K	( )
( ) R. M. Hodges, 9-113 SB-K	( )
( ) R. M. Parker, W4C126 C-K	( )
( ) J. L. Parris, 116 ESTA-K	( )
( ) R. J. Ogle, W11C68 C-K	( )
(X) J. C. Standifer, P-104 SB-K	( )
( ) J. P. Vineyard, A8 Sequoyah ENG	( )
( ) L. S. Cox, BLN OC (3)	( )
( ) G. Wadewitz, WBN OC (3)	( )
( ) J. T. Barnes, BLN OC QA	( )
(X) A. W. Rogers, WBN OC QA	( )

Special Instructions:

Principally prepared by: Gary Owens, extension 7160

ENDORS

RIGOROUS ANALYSIS HANDBOOK
POLICY STATEMENT

Policy No. 1
Section No. WBN-RAH-200

PLANT: WATTS BAR NUCLEAR PLANT

SUBJECT: DYNAMIC OVERLAPPING

DATE: APR 5 1983

The interface of two rigorously analyzed problems should be terminated with one of the following requirements for the dynamic case.

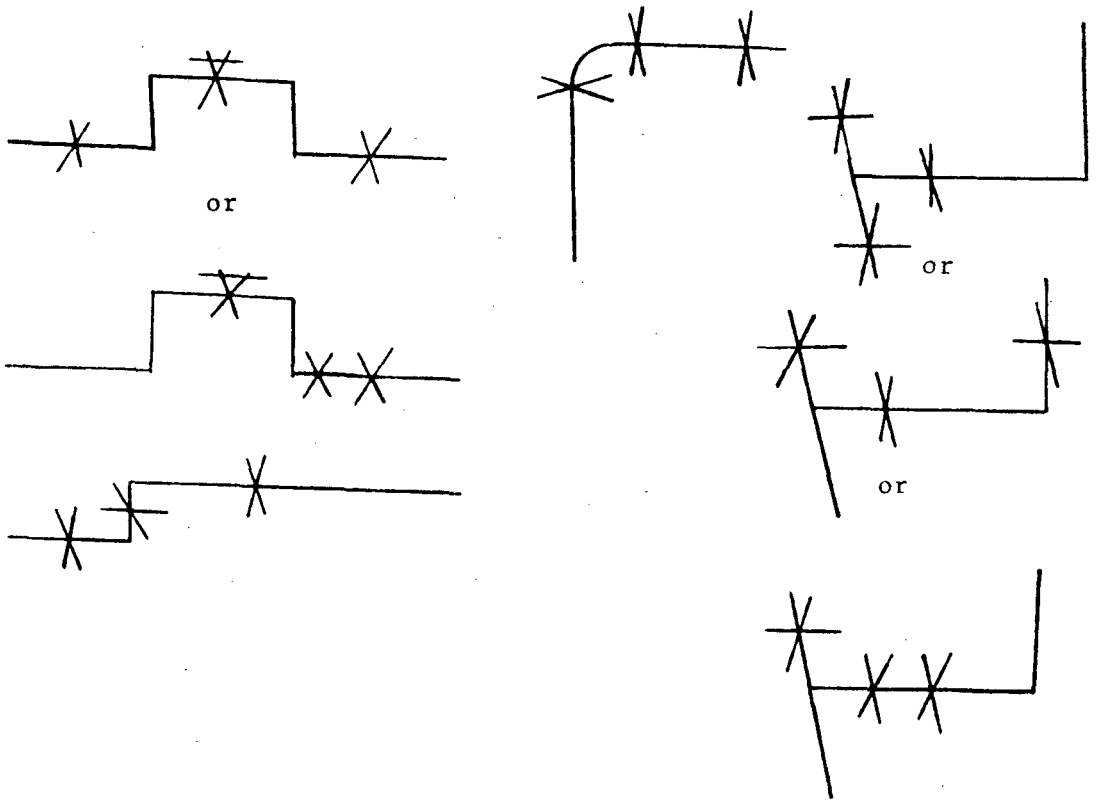
1. A structural anchor can be built which uncouples the problems. However, for some cases, this is not economically feasible. A stress intensification factor of 2.1 should be used in the analysis for the termination anchor. Tee anchors and inline anchors are acceptable.

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.

Preparer	2-28-83 Date	Group Head	4/22/83 Date
Section Supervisor	2-28-83 Date	Branch Chief	4/25/83 Date
Independent Reviewer	3-31-83 Date		

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

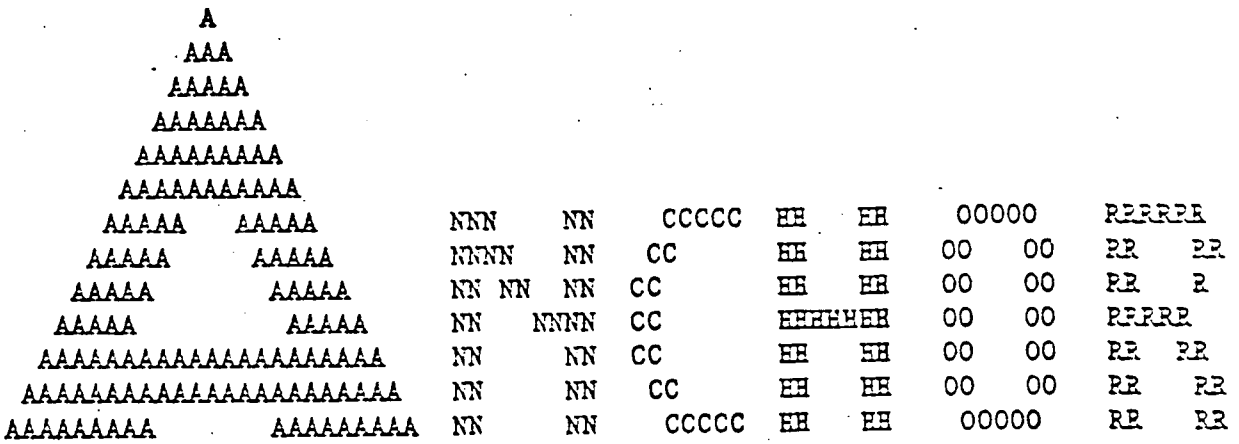
VERSION: 3.0

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.



Software ID 262235

ANCHOR 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: Signature/Date	Reviewed by: Signature/Date
R0	Version 1.0. Original version of the code.	J. E. McCord 3/15/76 J. E. McCord	Dietrich Riffert 11-14-81 Dietrich Riffert
R1	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 difference (reserve stress) is no longer input or reported.	D. W. Hargroves 5/6/83 D. W. Hargroves	Dave Loewus 5/18/83 J. David Loewus
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.	B. E. Cline 3/8/84 Barbara E. Cline	K. A. Brune 3/8/84 Kenneth A. Brune mcsafl (Independent Review)

TABLE OF CONTENTS

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 inline 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

L11+ = Larger of 0 and DW + PL +CS +SUP+
L11- = Smaller of 0 and DW + CS + SUP-
L11 = Larger of L11+ and /L11-/

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+ + WH+ +/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 Equation	Condition Normal	Loading Type	Design Loads*
8N	Normal	Primary	$L = /DW + PL + CS/$
11	Normal	Primary + Secondary	$L^+ = DW + PL + CS + SUP^+$ $L^- = DW + PL + CS + SUP^-$
9U	Upset	Primary	$L^+ = DW + PL + CS + VT^+ + WH^+ \quad +/E1/$ $L^- = DW + PL + CS + VT^- + WH^- \quad -/E1/$
9F	Faulted	Primary	$L^+ = DW + PL + CS \quad +/E2/ + WH^+ + VT^+$ $L^- = DW + PL + CS \quad -/E2/ + WH^- + VT^-$
N/A	Upset	Primary + Secondary	$L^+ = DW + PL + CS + SUP^+ + VT^+ + WH^+ \quad +/E1/$ $L^- = DW + PL + CS + SUP^- + VT^- + WH^- \quad -/E1/$
N/A	Faulted	Primary + Secondary	$L^+ + DW + PL + CS + SF^+ + VT^+ + WH^+ \quad +/EE/$ $L^- = DW + PL + CS + SF^- + VT^- + WH^- \quad -/EE/$

*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.

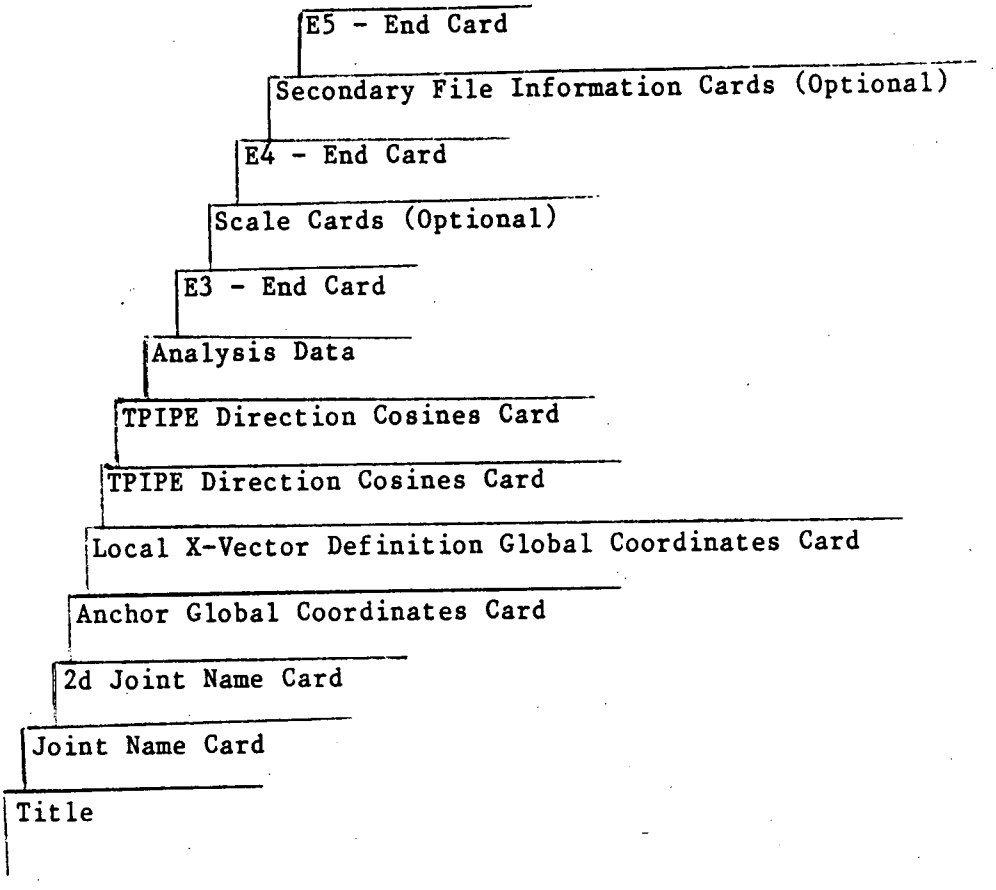


Figure 2.0

Title Card (One required)

Column	Format	Variable	Description
1-80	10A8	TITLE	Title

Joint Name Card

Column	Format	Variable	Description
1	A1	IH	Data = None
2-5	A4	JT	Joint name
7	A1	LM	Rounding code. Code "R" for round, "N" for not rounded. (N = default)

10	A1	NP	Option to print on special paper. 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	Format	Variable	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	Variable	Description
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

Column	Format	Variable	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.

Direction Cosine Cards from TPIPE (one card for each side required)

Column	Format	Variable	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 xs
21-30	F10.4	B(2)	Y xs — Global projection from TPIPE of direction xs.
31-40	F10.4	B(3)	Z xs
41-50	F10.4	B(4)	X ys
51-60	F10.4	B(5)	Y ys — Global projection from TPIPE of direction ys.
61-70	F10.4	B(6)	Z 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 Data Cards (One card for each joint for each load source)

Column	Format	Variable	Description
1	A1	IH	Data = None
2-5	A4	JT	Joint name
7-8	A2	IT	Load source. See figure 3.0
10	I1	IS	Side number.
11-20	F10.4	FX	Forces (lbs) from TPIPE PIPING SYSTEMS
21-30	F10.4	FY	REACTIONS TABLE (Keep sign)
31-40	F10.4	FZ	

41-50	F10.4	FX	Moments (ft. lb.) from TPIPE PIPING
51-60	F10.4	FY	SYSTEMS REACTIONS TABLE (Keep sign).
61-70	F10.4	FZ	
71-80	A10		Comments

End Card (one card required after the above set of cards)

Column	Format	Variable	Description
1	A1	IH	Date = "E"

ANCHOR

Figure 3.0

ANALYSIS CODES - LOAD SOURCES

Code	Description	Note
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
V2	Valve thrust No. 2	1
W1	Water hammer No. 1	1
W2	Water hammer No. 1	1
T1		
T2		
T3		
T4		
T5	Thermal modes	1
T6		
T7		
T8		
T9		
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.

Scale cards Load case to be created by scaling an existing load case (previous input section)

Column	Format	Variable	Description
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	I1	IS1	Side number (1 or 2)
17-18	A2	IT2	Analysis type of data to be created. See figure 3.0
21	I1	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	Variable	Description
1	A1	JH	Data = "E"

Secondary Load File Cards[1]

Column	Format	Variable	Description
1	A1	IH	Data = None
3-4	A2	IT1	Code T1, T2, T3, T4, T5, etc.[2]
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

[1]See discussion on Secondary Load Evaluation in Section 2.0 for explanation of the requirements for this entry.

[2]If this Code is not specified, scale factors will be ignored.

End Card (One card after the above cards)

Column	Format	Variable	Description
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.
   _____ ,_____ ,_____

10. Error - At least one direction cosine vector is greater than 1.0.
    Local-x:_____ Local-y:_____ Local-z:_____

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) C01. 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: C01.

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

TVA ENGINEERING DESIGN SOFTWARE SUMMARY — ATTACHMENT NO. 1

01. SUMMARY DATE YR./MO./DAY: 82/05/12	02. SUMMARY PREPARED BY: J. D. LOEWUS
04. SOFTWARE DATE YR./MO./DAY: 82/05/12	05. SOFTWARE TITLE: ANCHOR LOAD PROGRAM
06. SHORT TITLE: ANCHOR	03. PREVIOUS SOFTWARE ID: 000000
	07. NEW SOFTWARE ID: 262235

08. SOFTWARE TYPE
- [ ] AUTOMATED DATA SYSTEM
- [ ] COMPUTER PROGRAM
- [ ] SUBROUTINE/MODULE

09. PROCESSING MODE
- [ ] INTERACTIVE
- [ ] BATCH
- [ ] COMBINATION

10. APPLICATION AREA

GENERAL
- [ ] COMPUTER SYSTEMS SUPPORT/UTILITY
- [ ] SCIENTIFIC/ENGINEERING
- [ ] BIBLIOGRAPHIC/TEXTUAL
- [ ] MANAGEMENT/BUSINESS
- [ ] PROCESS CONTROL
- [ ] OTHER

SPECIFIC

11. SUBMITTING ORGANIZATION AND ADDRESS

COMPUTER SERVICES AND STRUCTURAL ANALYSI
TVA DIVISION OF ENGINEERING DESIGN
W9A17 C-K
KNOXVILLE ,TN 37902

12. TECHNICAL CONTACT(S)

J.D. LOEWUS

13. NARRATIVE

THE ANCHOR LOAD PROGRAM ACCEPTS AS INPUT FORCES AND MOMENTS FOR ONE OR TWO SIDES OF A PIPE ANCHOR. THESE FORCES AND MOMENTS ARE OBTAINED FROM STRUCTURAL PIPING ANALYSIS PROGRAMS FOR LOAD CASES SUCH AS DEAD WEIGHT , THERMAL , SEISMIC AND OTHERS. THE ANCHOR LOAD PROGRAM COMBINES ALL LOADS AND PRINTS AN ANCHOR LOAD TABLE GIVING THE ANCHOR DESIGN LOADS.

14. KEYWORDS

PIPING AND PRESSURE VESSEL , ANCHOR LOAD , LOAD COMBINATION, TPIPE

15. COMPUTER MANUF'R AND MODEL	16. COMPUTER OPERATING SYSTEM	17. PROGRAMMING LANGUAGE(S)	18. NUMBER OF SOURCE STATEMENTS
CDC/176	NOS	FORTRAN IV	700
19. COMPUTER MEMORY REQUIREMENTS	**20. TAPE DRIVES**	**21. DISK/DRUM UNITS**	**22. TERMINALS**
60K	NONE	NONE	NONE

23. OTHER OPERATIONAL REQUIREMENTS

NONE

24. SOFTWARE AVAILABILITY

AVAILABLE [X] LIMITED [ ] IN-HOUSE ONLY [ ]

25. DOCUMENTATION AVAILABILITY

AVAILABLE [X] INADEQUATE [ ] IN-HOUSE ONLY [ ]

26. AUTHOR(S)

JON E MCCORD

27. QUALITY ASSURANCE

- [ ] PROGRAM CONFORMS TO EN DES-EP 3.23
- [ ] CLASS I
- [ ] CLASS II

APPENDIX B

Checklist for Program Documentation

PROGRAM ANCHOR Version 2.0
Reviewer TR Harvey
Extension 5-5503

1.	Class I program	
2.	Class II	
	The following items apply for Class I programs.	
3.	Source code available.	✓
4.	INPUT and OUTPUT files provided for verification	✓
5.	Verification documentation adequate	✓
	The following items apply for Class II programs.	
	User manual.	✓
6.	Title page	✓
	a. Software title	✓
	b. Author	✓
	c. Responsible organization	✓
	d. Date	✓
7.	Revision page with revision date ≥ compile date of binary or otherwise mod date in catlist	✓
8.	Table of contents	✓
9.	TVA EN DES software summary	✓
10.	Program description	✓
	a. Purpose and scope	✓
	b. Basic theory	✓
	c. Equations used or calculation rules	✓
11.	Assumptions and limitations	✓
12.	Input requirements	✓
	a. Input format description	✓
	b. Input file names and description	✓
	c. Sample input	✓

13. Output description ✓

    a. Output file names and descriptions ✓
    b. Output explanation--possible different combinations of output
    c. Explanation of error statements ✓
    d. Sample outputs ✓

14. References to include applicable: codes, standards, manuals, text, and papers with dates, authors, or responsible organization, and publisher ✓

15. Execution instructions ✓

General Checks

16. One of the following is available:

    a. Source and JCL saved on time sharing with "-FILES" ✓
    b. Source and JCL stored on cards with Computer Services Section N/A
    c. Source and JCL saved on magnetic tape N/A

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 N/A

APPENDIX C

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	Description	TPIPE Support Type	Notes
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
E1	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	7
WH	Water hammer - Activates snubbers (directional)	D	
EE	The larger of E1 and E2	D	

Notes

1. 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. J1 is a valid load case but will not be considered in the analysis phase.

5. 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^2)
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 (lb/in^2)
Q	Design travel (inches)
R	Maximum pipe movement (inches)

S	Stress (lb/in^2)
T	Ratio N/K (lb/in^2/pound)

Equation - Condition

Symbol

8N	ASME NC-3652 equation 8 for normal condition (primary)
9U	ASME NC-3652 equation 9 for upset condition (primary)
9E	ASME NC-3652 equation 9 for emergency condition (primary)
9F	ASME NC-3652 equation 9 for faulted condition (primary)
10	ASME NC-3652 equation 10 for normal condition (secondary)
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 ($inches^3$)

i = Intensification factor (figure NC-3673.2[b]-1)

P = Peak pressure (lb/in^2g)

Pr = Design pressure (lb/in^2g)

Do = Outside diameter (inches)

d = Inside diameter (inches)

SH = Hot allowable stress (lb/in^2)

SC = Cold allowable stress (lb/in^2)

f = Stress range reduction factor

SA = f(1.25 SC + 0.25 SH) (NC-3611.2)

Term Definition

AXX^+ 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)

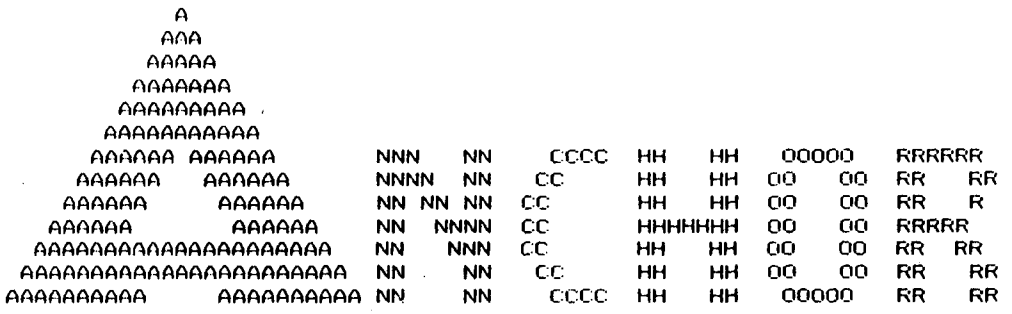
Support Categories

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

APPENDIX D



ANCHOR LOAD PROGRAM

TENNESSEE VALLEY AUTHORITY

VERSION 2.0

MAY 06,1983

* * * * * ANCHOR INPUT DATA ECHO * * * * *

```
         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890

ANCHOR LOADS ON ANCHOR 120, PROBLEM N3-XX-XXX, ONE SIDE ONLY
 120  N              LOADS FROM SIDE 1 = TPIPE SIDE 1 RUN
 120                 LOADS FROM SIDE 2 = 0 (LOADS FROM ONE SIDE ONLY)
 120       -149.6666 708.0000  -88.6666
 C01       -149.6666 708.0000  -81.5000
 120      1-.3214     .7600     -.5567
 120      2
 120  DW  1  -9.53     28.56     31.54     27.48    -18.58    -14.29   DW
 120  T1  1-269.03    203.42    258.84   -369.59   -524.10    -47.59   THERMAL 1
 120  T2  1    .98     -4.96     -1.77     10.24      1.91       .59
 120  S1  1   -.45      6.66      -.55    -12.98      -.88       .09   OBE SAM
 120  E1  1  23.23     15.87     19.15     30.61     45.09     45.90   XY OBE
 120  E1  1  14.02     23.81     39.68     45.93     27.20     30.55   YZ OBE
 120  E2  1  32.78     20.34     23.56     39.22     63.63     67.46   XY SSE
 120  E2  1  20.40     37.38     65.32     72.10     39.59     43.61   YZ SSE
E
  SC S1  1      S2  1  2.0
E
E

         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
```

ANCHOR LOADS ON ANCHOR 120, PROBLEM N3-XX-XXX, ONE SIDE ONLY
120 N 1.0000 LOADS FROM SIDE 1 = IPIPE 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	C01	-149.6666	708.0000	-81.5000

LOCAL COORDINATE SYSTEM FOR ANCHOR (RELATIVE TO GLOBAL)

INPUT X VECTOR			INPUT Y VECTOR			INPUT Z VECTOR			
X	Y	Z	X	Y	Z	X	Y	Z	
0.0000	0.0000	1.0000	0.0000	1.0000	0.0000	-1.0000	0.0000	0.0000	
90.00	90.00	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	-.3214	.7600	-.5567	0.0000	0.0000	0.0000			
	INPUT X VECTOR			INPUT Y VECTOR			INPUT Z VECTOR			
	X	Y	Z	X	Y	Z	X	Y	Z	
	-.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			INPUT Y VECTOR			INPUT Z VECTOR			
	X	Y	Z	X	Y	Z	X	Y	Z	
	1.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	1.0000	
	0.00	90.00	90.00	90.00	0.00	90.00	90.00	90.00	0.00	DEGREES

ANALYSIS DATA (INPUT COORDINATE SYSTEM)

JOINT	TYPE	S	FX	FY	FZ	MX	MY	MZ	COMMENT
120	DW	1	-9.5	28.6	81.5	27.5	-18.6	-14.3	DW
120	T1	1	-269.0	203.4	258.8	-369.6	-524.1	-47.6	THERMAL 1
120	T2	1	1.0	-5.0	-1.8	10.2	1.9	.6	
120	S1	1	-.5	6.7	-.6	-13.0	-.9	.1	ORE SAM
120	E1	1	23.2	15.9	19.2	30.6	45.1	45.9	XY ORE
120	E1	1	14.0	23.8	34.7	45.9	27.2	30.6	YZ ORE
120	E2	1	32.8	20.3	43.6	39.2	63.6	67.5	XY SSE
120	E2	1	20.4	37.4	65.3	72.1	39.6	43.6	YZ SSE

SCALED DATA

USER LOAD CASE	SCALE FACTOR	USER LOAD CASE

S1 SIDE 1 2.0000 S2 SIDE 1

ANCHOR LOADS ON ANCHOR 120, PROBLEM N3-XX-XXX, ONE SIDE ONLY
LOADS IN GLOBAL COORDINATE SYSTEM

DISPLAY- SIDE NO.= 1, JOINT IS 120 , LOAD IS ON THE PIPE.

FX	FY	FZ	MX	MY	MZ	LOAD CASE
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
0.0	0.0	0.0	0.0	0.0	0.0	DM
41.3	11.2	8.4	-28.3	8.9	-20.4	DW
48.0	27.9	43.4	66.8	52.5	69.8	E1
77.4	39.6	68.7	95.3	80.4	97.6	E2
0.0	0.0	0.0	0.0	0.0	0.0	FL
3.2	4.6	4.9	4.6	10.4	7.9	S1
6.3	9.3	9.9	9.2	20.9	15.7	S2
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	0.0	0.0	W1
0.0	0.0	0.0	0.0	0.0	0.0	W2
388.3	-73.1	154.9	-122.5	-619.3	-117.0	T1
-3.7	-2.5	-2.9	-2.1	9.0	-4.7	T2
0.0	0.0	0.0	0.0	0.0	0.0	T3
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
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	T7
0.0	0.0	0.0	0.0	0.0	0.0	T8
0.0	0.0	0.0	0.0	0.0	0.0	T9

DISPLAY- SIDE NO.= 2, JOINT IS 120 , LOAD IS ON THE PIPE.

FX	FY	FZ	MX	MY	MZ	LOAD CASE
0.0	0.0	0.0	0.0	0.0	0.0	
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
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
0.0	0.0	0.0	0.0	0.0	0.0	E2
0.0	0.0	0.0	0.0	0.0	0.0	PL
0.0	0.0	0.0	0.0	0.0	0.0	S1
0.0	0.0	0.0	0.0	0.0	0.0	S2
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	0.0	0.0	W1
0.0	0.0	0.0	0.0	0.0	0.0	W2
0.0	0.0	0.0	0.0	0.0	0.0	T1
0.0	0.0	0.0	0.0	0.0	0.0	T2
0.0	0.0	0.0	0.0	0.0	0.0	T3
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
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	T7
0.0	0.0	0.0	0.0	0.0	0.0	T8
0.0	0.0	0.0	0.0	0.0	0.0	T9
0.0	0.0	0.0	0.0	0.0	0.0	T0

ANCHOR LOADS ON ANCHOR 120, PROBLEM N3-XX-XXX, ONE SIDE ONLY

SECONDARY FILE INFORMATION

THERMAL LOAD CASE	SCALE FACTORS UPSET	FAULTED DM-S2	FAULTED CP-CT-S2

TOTAL LOAD FROM BOTH SIDES IN THE GLOBAL SYSTEM

JOINT = 120

FX	FY	FZ	MX	MY	MZ	LOAD CASE
0.0	0.0	0.0	0.0	0.0	0.0	
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
48.0	27.9	43.4	66.8	52.5	69.8	DW
77.4	39.6	68.7	95.3	80.4	97.6	E1
0.0	0.0	0.0	0.0	0.0	0.0	E2
3.2	4.6	4.9	4.6	10.4	7.9	PL
4.3	9.3	9.9	9.2	20.9	15.7	S1
0.0	0.0	0.0	0.0	0.0	0.0	S2
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	0.0	0.0	W1
-388.3	73.1	-154.9	122.5	619.3	117.0	W2
3.7	2.5	2.9	2.1	-9.0	4.7	T1
0.0	0.0	0.0	0.0	0.0	0.0	T2
0.0	0.0	0.0	0.0	0.0	0.0	T3

	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0

T5
T6
T7
T8
T9
T0

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 EQ.	CONDITION	LOAD TYPE	DESIGN LOADS FX	FY	FZ	DESIGN MOMENTS MX	MY	MZ	
8N	NORMAL	P	41	11	8	28	8	20	TRUE VALUE
8N	NORMAL	P	50	20	10	30	10	30	ROUNDED NEAREST 10
8N	NORMAL	P	50	20	10	40	10	30	ROUNDED 10%
11	NORMAL	P+S	41	11	8	28	8	20	TRUE VALUE
11	NORMAL	P+S	50	20	10	30	10	30	ROUNDED NEAREST 10
11	NORMAL	P+S	50	20	10	40	10	30	ROUNDED 10%
9U	UPSET	P	89	39	51	95	61	90	TRUE VALUE
9U	UPSET	P	90	40	60	100	70	100	ROUNDED NEAREST 10
9U	UPSET	P	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%
9F	FAULTED	P	118	50	77	123	89	118	TRUE VALUE
9F	FAULTED	P	120	60	80	130	90	120	ROUNDED NEAREST 10
9F	FAULTED	P	140	60	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	P+S	140	60	90	140	100	130	ROUNDED 10%

ANCHOR LOADS IN THE LOCAL COORDINATE SYSTEM

CODE EQ.	CONDITION	LOAD TYPE	DESIGN LOADS FX	FY	FZ	DESIGN MOMENTS MX	MY	MZ	
8N	NORMAL	P	8	11	41	20	8	28	TRUE VALUE
8N	NORMAL	P	10	20	50	20	10	30	ROUNDED NEAREST 10
8N	NORMAL	P	10	20	50	30	10	40	ROUNDED 10%
11	NORMAL	P+S	8	11	41	20	8	28	TRUE VALUE
11	NORMAL	P+S	10	20	50	20	10	30	ROUNDED NEAREST 10
11	NORMAL	P+S	10	20	50	30	10	40	ROUNDED 10%
9U	UPSET	P	51	39	89	90	61	95	TRUE VALUE
9U	UPSET	P	60	40	90	90	70	100	ROUNDED NEAREST 10
9U	UPSET	P	60	50	100	100	70	110	ROUNDED 10%
	UPSET	P+S	51	39	89	90	61	95	TRUE VALUE
	UPSET	P+S	60	40	90	90	70	100	ROUNDED NEAREST 10
	UPSET	P+S	60	50	100	100	70	110	ROUNDED 10%
9F	FAULTED	P	77	50	118	118	89	123	TRUE VALUE
9F	FAULTED	P	80	50	120	120	90	130	ROUNDED NEAREST 10
9F	FAULTED	P	90	60	130	130	100	140	ROUNDED 10%
	FAULTED	P+S	77	50	118	118	89	123	TRUE VALUE
	FAULTED	P+S	80	50	120	120	90	130	ROUNDED NEAREST 10
	FAULTED	P+S	90	60	130	130	100	140	ROUNDED 10%

NOTE 1-- LOCAL COORDINATE SYSTEM DEFINITION

LOCAL X: DIRECTED FROM ANCHOR TO NODE POINT C01
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 EQ.	CONDITION	LOAD TYPE	DESIGN LOADS FX	FY	FZ	DESIGN MOMENTS MX	MY	MZ
SN	NORMAL	P	50	20	10	30	10	30
11	NORMAL	P+S	50	20	10	30	10	30
9U	UPSET	P	90	40	60	100	70	100
	UPSET	P+S	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

CODE EQ.	CONDITION	LOAD TYPE	DESIGN LOADS FX	FY	FZ	DESIGN MOMENTS MX	MY	MZ
SN	NORMAL	P	10	20	50	20	10	30
11	NORMAL	P+S	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	P	80	50	120	120	90	130
	FAULTED	P+S	80	50	120	120	90	130

NOTE 1-- LOCAL COORDINATE SYSTEM DEFINITION

LOCAL X: DIRECTED FROM ANCHOR TO NODE POINT C01
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

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

MEDS Accession No. CEB 830608 009

[1] REPORT NO. CEBCEB8302 R1

[2] PLANT BFN, SQN, WBN, BLN [3] UNIT All

[4] PREPARER/ORGANIZATION/DATE D. W. Hargroves/EN DES-CEB/5-24-83

[5] DESCRIPTION OF CONDITION

See Attachment 1 for description

840803F0055 (5)

[6] DATE OF OCCURRENCE EST (x), ACT. ( ) 1976

[7] METHOD OF DISCOVERY

[8] UNID CODE (EN DES-EP 8.01)

[9] SIGNIFICANT CONDITION ADVERSE TO QUALITY YES [X] NO [ ]

[10] *BRANCH CHIEF/DATE

[11] CORRECTIVE ACTION

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.

[12] CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES [ ] NO [ ]

[13] DESIGN CRITERIA DOCUMENT NO EXCEPTION REQUEST NO

[14] ECN REQUIRED [ ] YES NO [ ] ECN NO

[15] SCHEDULE IMPACT [ ] P [ ] A [ ] N

NONCONFORMANCE REPORT

[1] REPORT NO. GENCEB8402 R1

[16] ASSIGNABLE CAUSE (REQUIRED IF SIGNIFICANT)

Incorrect data specifications contained in the user's manual.
Subsequent misuse of program.
Misinterpretation of output.

[17] THIS IS A GENERIC CONDITION YES ☐ NO ☐

[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.

[19] *INDEPENDENT REVIEW MJK 6/6/84 for David Lowrie

[20] LABOR EST. ( ), ACT. ( ) MH [21] SCHEDULE EST ( ), ACT ( ) DAYS

[22] ACTIVITY NO. [23] TASK DESCRIPTION [24] DATE INITIATED

[25] REMARKS

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 because the ANCHOR program has not been used to date. This NCR is superseded by GENCEB8402, MEDS accession number CEB 840312 003.

[27] DISTRIBUTION
[28] CONST PROJECT MANAGER
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

[26] ALL EN DES ACTION COMPLETE

R O Barnett 7-17-84
*BRANCH CHIEF/ORG. DATE

CEB 840717 006
MEDS ACCESSION NO.

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.

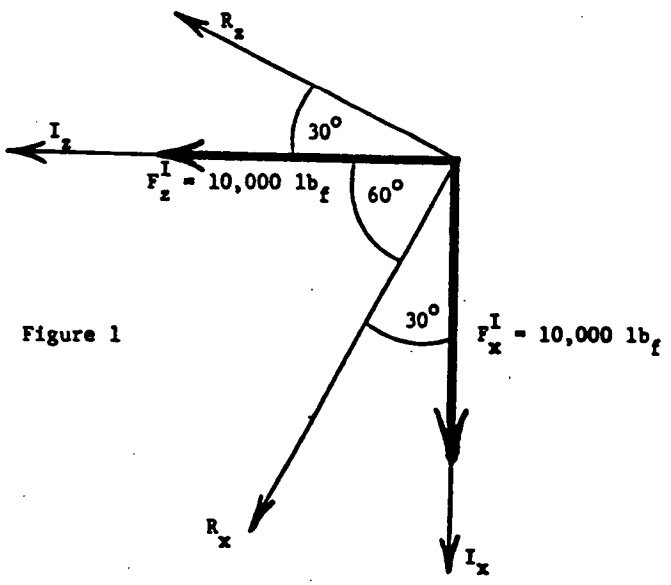


Figure 1

This subtle difference can best be illustrated with an example. Consider a 10,000 lb_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° 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:

$$F_x^R = 13{,}600, \quad F_z^R = 3{,}660$$

The ANCHOR manual describes the system relations, relative angles, and direction cosines as:

I_x to R_x	I_x to R_y	I_x to 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:

R_x to I_x	R_x to I_y	R_x to I_z
30°	90°	60°
0.8660	0.0	-0.5000

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.

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, ver-ion 2.0. Supports have been redesigned and installed.

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

MEOS Accession No. CEB'840312 003

[1] REPORT NO. CENCEB8402

[2] PLANT BFN, SQN, WBN, BLN [3] UNIT All

[4] PREPARER/ORGANIZATION/DATE D. C. [illegible] EN DES-CEB/3-7-84

[6a] DESCRIPTION OF CONDITION

Errors have been found in us[illegible]sion 2.0 of the ANCHOR program for determining the design loads f[illegible]ng anchors. The outputs of the global loads from the program are c[illegible]t ve. However, the results of the transformation from global coordi[illegible] system to local coordinate system for [illegible]ed anchors (that is, anchor [illegible]e local axes are not parallel to one of the global directions) are [illegible]nservative. It is mainly due to the use of absolute values of the glob[illegible] loads. Reversing global loads have not been considered in the proces[illegible]ordinate system transformation.

8406040078 (3)

[5b] SYSTEM Multiple [5c] [illegible] OR WBN E N/A [5d] CONTRACT NO. N/A

[6] DATE OF OCCURRENCE EST (X) ACT ( ) 1985

[7] METHOD OF DISCOVERY See Description of Condition (Block 6a)

[8] UNID CODE (EN DES-EP 8.01)

[9] SIGNIFICANT CONDITION ADVERSE TO QUALITY YES [X] NO [ ]

[10] *BRANCH CHIEF/DATE [illegible] 3/6/84

[11a] CORRECTIVE ACTION

-Correct errors in [illegible] ANCHOR [illegible]. Notify piping analysis groups of the conditi[illegible] these errors.

-Request a review of issued and [illegible] triples and [illegible] anchor load determined to be unconservativ[illegible] reissue anchor load [illegible]

-Modify any deficient [illegible]chor support designs.

[11b] SCHEDULED DATE OF COMPLETION Completed

[12] CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES [ ] NO [X]

[13] DESIGN CRITERIA DOCUMENT NO. EXCEPTION REQUEST NO.

[14] ECN REQUIRED [X] YES [ ] NO ECN NO. 3882 (WBN) [15] SCHEDULE IMPACT [ ] P [ ] A [X] N

NONCONFORMANCE REPORT

[1] REPORT NO. CENCEB8402

[16] ASSIGNABLE CAUSE (REQUIRED IF SIGNIFICANT)

Unconservative transformation of the coordinate system for a skewed anchor was introduced in the version 2 of the ANCHOR program, due to inadequate definition of computer program capabilities. ROBE 5/14/84

[17] POTENTIAL GENERIC CONDITION REVIEW REQUIRED (IN DES-EP * 52) YES [X] NO [ ]

[18a] ACTION REQUIRED TO PREVENT RECURRENCE (REQUIRED IF SIGNIFICANT)

-Revise version 2 ANCHOR program

-Issue version 3 ANCHOR program

- Revise and update program documentation including development of additional benchmark problems. A plan for piping analysis program documentation is devised for TVA's computer aided piping analysis and support design program development (CEB 830920 003). The plan which requires extensive program documentation requirements is being implemented for all program development and updates.

[18b] SCHEDULED DATE OF COMPLETION Completed

[19] *INDEPENDENT REVIEW K A Barnett 14-54 5/14 5/21/84

[20] LABOR EST ( ), ACT ( ) MH [21] SCHEDULE EST. ( ), ACT. ( ) DAYS

[22] ACTIVITY NO.	[23] TASK DESCRIPTION	[24] DATE INITIATED

[25] REMARKS

-This NCR supersedes NCR CENCEB8302 R1.

[27] DISTRIBUTION:
[28]
CONST PROJECT MANAGER
EN DES PROJECT MANAGER
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

[26] ALL EN DES ACTION COMPLETE:

K A Barnett 5/25/84
*BRANCH CHIEF/ORG. DATE

CEB '84 0525 002
MEDS ACCESSION NO.

EN DES
NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

NCR NO. GENCEB8402

SIGNIFICANT YES ☒ NO ☐ REPORTABLE YES ☒ NO ☐

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 ☒ No ☐ If 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	WBP840510524	5/10/84

D. Is action by organization outside EN DES required? Yes ☐ No ☒
Organization tracking No. _____

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 ☒ No ☐

G. Remarks:

NCA

Verified By Dennis Adams Date 5/11/84

TVA Task Force for
Review of Black &
Veatch Findings

EVALUATION SHEET

Rev. R2
Date 11/18/83

1. 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. Howard L. Brown 4/18/83 Task Force Concurrence W. L. Jones 4/20/83

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 6000-1 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. Howard L. Brown 4/18/83 Task Force Concurrence W. L. Jones 4/20/83

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 Thomas L. Brown 4/18/83 Task Force Concurrence W L Lyon 4/20/83

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 Thomas L. Brown 4/18/83 Task Force Concurrence W L Lyon 4/20/83

7A. Identification of Corrective Action for Completed Work

A. Preliminary

The plan in 6AA is adequate.

B. Final

Concur.

Resp. Org Thomas K. Brown 4/18/83 Task Force Concurrence W L Lyon 4/20/83

8A. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

The implementation of NRC Bulletin OIE 79-14 is required prior to unit fuel loading. This requirement will ensure implementation and inspection of corrective action for completed work.

B. Final

Concur.

Resp. Org. Thomas R Brown 4/18/83 B4 Rom Task Force Concurrence RW W L Lawn 4/18/83

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 with 9.A. In addition we have corrected the misinterpretation of pipe side welds on B-P drawing through additional training of inspectors.

Resp. Org. Thomas R. Brown 4/19/83 Task Force Concurrence W L Lawn 4/20/83

10A. Identification of Corrective Action for Future Work

A. Preliminary

Same comment as 9AA above.

B. Final

Same as 9A.B.

Resp. Org. Thomas R Brown 4/19/83 Task Force Concurrence W L Lawn 4/20/83

11A. Implementation of Corrective Action for Future Work

A. Preliminary

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).

B. Final

Concur.

Resp. Org. Thomas R Brown 11/18/83 Task Force Concurrence W. J. Johnson 11/18/83

12A. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

Implementation of Phase II of the 79-14 program will verify the final design and acceptance of the hangers.

B. Final

~~Concur. Audits by other gorups will strengthen this program also. No further action required on this Black & Veatch category. This item is closed.~~ 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 8, 1984 (QMS 841108 201)

11/16/84

Resp. Org. Howard L. Brown 4/18/83 Task Force Concurrence J. W. von Weisenstein 11-21-84 W. J. Johnson 12/31/84

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

TVA 64 (08-9-83)

UNITED STATES GOVERNMENT

Memorandum

8411137 0600 (6

TENNESSEE VALLEY AUTHORITY

QMS '841108 201

TO : Quality Management Staff Files

FROM : 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."

J. W. von Weisenstein

JvW:MBP
Attachments
cc: 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 (7706)

11/8/84 - EGB:MBP
cc (Attachments).
R. W. Cantrell, W11A9 C-K
[redacted], 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 the NCR form.
02180
D. B. Bowen, W11A8 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: 7

Prepared By: D. Anthony Vlach
Date: 11/5/84

Approved By:
Date:

Concerns: NO / / Yes /X / (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 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.

II. 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.

02050

III. Details:

A. Performed the following surveillance activities to verify corrective action implementation for completed work:

1. 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-NEB-NLS was interviewed about the EN DES NCR. 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 CONST NCRs and one EN DES NCR. These NCRs have been closed out with the exception of one CONST NCR and the EN DES NCR.

Disposition for NCR 4486R has been completed, but NCR has not been closed out.

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.

02050

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 WBNSWP8307 indicated that Hanger Engineering and Quality Control Units were to receive additional training emphasizing implementation of drawing requirements. Interviewed Robert McKay 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.

2. Assess the effectiveness of the IE 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)

NCR 4455R (WBN 821126 135)
NCR 4478R (WBN 821102 152)
NCR 4480R R1 (WBN 830525 110)
NCR 4481R R1 (WBN 830525 111)
NCR 4486R (WBN 821207 101)
NCR 4535R (WBN 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. List of Personnel Contacted:

Name	Title	Organization
Tom Brown	Asst. CONST Engineer (Civil & Hangers)	WBP
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: 1

Prepared By: L. T. Brock
Date: 9/14/88

Approved By: [signature]
Date: 9-20-88

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 79-14 program. Assess the effectiveness of this program and evaluate this category for closure based upon control by 79-14 or some other rationale.

02050

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

MEDS Accession No. SWP '83 0111 036

[1] REPORT NO. WBNSWP8307

[2] PLANT WATTS BAR NUCLEAR PLANT [3] UNIT 1

[4] PREPARER/ORGANIZATION/DATE G. L. Pennington/SWP/January 11, 1983

[5] DESCRIPTION OF CONDITION

Pipe support 03B-1AFW-R149 was not installed per design drawing 03B-1AFW-R149 Rev 904 and will not allow .4-inch thermal movement required per load table 47B427-471 R0 and therefore does not meet the design requirements in FSAR 3.9.3.4.2 C Part 4.

This deficiency was identified during Black and Veatch review on finding F367.

8412310404 (3)

[6] DATE OF OCCURRENCE ESTIMATED 12/31/81

[7] METHOD OF DISCOVERY Black & Veatch Review

UNID CODE (EN DES-EP 8 01)

[9] SIGNIFICANT CONDITION ADVERSE TO QUALITY YES [X] NO [ ]

[10] *BRANCH CHIEF/DATE JC Stardy 1-11-83

[11] CORRECTIVE ACTION

Support was installed correctly as shown on drawing 03B-1AFW-R149 R904 (see also NCR 4622 R0).

[12] CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES [ ] NO [X]

[13] DESIGN CRITERIA DOCUMENT NO EXCEPTION REQUEST NO

[14] ECN REQUIRED [ ] YES NO [X] ECN NO [15] SCHEDULE IMPACT

2340

NONCONFORMANCE REPORT

[1] REPORT NO WBNSWP8307*

[16] ASSIGNABLE CAUSE: (REQUIRED IF SIGNIFICANT)

Pipe support 03B-1AFW-R149 was not installed according to the design drawing. The support drawing required that the pipe sleeve be cut off flush with the wall; however, the sleeve was notched with a torch to provide clearance, but due to the irregular pattern of cutting, the clearance proved to be insufficient.

[17] THIS IS A GENERIC CONDITION YES ☐ NO ☒

[18] ACTION REQUIRED TO PREVENT RECURRENCE: (REQUIRED IF SIGNIFICANT)

The Hanger Engineering and Quality Control units will receive additional training, emphasizing for explicit implementation of drawing requirements including notes specified on the drawings.

[19] *INDEPENDENT REVIEW: Jack B. Thomas 12/7/84

[20] LABOR EST. ( ), ACT. ( ) MH [21] SCHEDULE EST ( ), ACT ( ) N/A DAYS

[22] ACTIVITY NO. N/A [23] TASK DESCRIPTION N/A [24] DATE INITIATED N/A

[25] REMARKS:

The original of NCR WBNSWP8307 has been lost.

[27] DISTRIBUTION:
CONST PROJECT MANAGER G. L. Pennington, 374 GB-K
[28] EN DES PROJECT MANAGER
CHIEF, ESB
OFFICE OF QA
NEB (for Significant NCRs)**
MEOS 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

[26] ALL EN DES ACTION COMPLETE

*BRANCH CHIEF/ORG. DATE 12/7/84

CEB '841219 007

MEDS ACCESSION NO.

2 3 4 1

EN DES
NONCONFORMANCE REPORT COMPLETION VERIFICATION SHEET

NCR NO. WBNSWP8307

SIGNIFICANT
YES ☒ NO ☐

REPORTABLE
YES ☒ NO ☐

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 ☒ RDP 12/7/84 No ☐ If yes, list in (C) below.

C. Documents related to the NCR (ECN, analyses, memos, contract No., etc.)

	REF OR MEDS ACCESS. NO.	COMPLETION DATE
NA		

D. Is action by organization outside EN DES required? Yes ☒ No ☐
Organization tracking No. CONST NCR 4622 R0

E. Has all necessary EN DES information been transmitted to an organization outside EN DES to enable the completion of work required?
Yes ☒ RDP 12/7/84 No ☐ N/A ☒ If yes, list in (C) above.

F. Is all EN DES action complete? Yes ☒ No ☐

G. Remarks:

EDB Verified By R. J. Pratt Date 12/7/84

Page __ of

2342

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.

1. 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 QC 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. 4.

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:

1. 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.

02160

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 R0
47A464-1 R1
47A400-7-1 R0

Embedded Plate Drawings:

48B1223-6A-29 R1
48W1228-2 R2
48B1225-2A-49 R0

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:

C03-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"

02160

Project Construction Specification:

N3C-928, "Locating Attachments on Embedded Plates"

EN DES Calculations:

WC8-1-218, "Minor Load Guidelines - EP 4.03, section 3.0, Technical Specification" (WBP 840515 212)

03B1AFWR106, "Auxiliary Feedwater System Pipe Support Drawing No. 03B-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 C03-S-84-0089-D01" (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 WBEP Files, "Field Change Requests Initiated by OC-EP 4.03 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	SC-4, Mechanical Engineer	WBEP
R. G. Pratt	M-5, Mechanical Design Supv.	WBEP
Doug Martin	M-5, Civil Design Supervisor	WBEP
Bill Wilson	SC-3, Civil Engineer	WBEP
Wayne Smathers	M-5, On-Site Watts Bar Engineering Analysis Section	WBEP

VI. Scoping Document (Attached)

02160

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 Plant Units 1 and 2
CATEGORY: 9

Prepared By: L. E. Brock
Date: 9/19/84

Approved By: [signature]
Date: 9-18-84

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.

02160

DIVISION OF ENGINEERING DESIGN
NONCONFORMANCE REPORT

MEDS Accession No. CEB 830608 009

[1] REPORT NO. GENCEB8302 R1

[2] PLANT BFN, SQN, WBN, BLN	[3] UNIT All
[4] PREPARER/ORGANIZATION/DATE D. W. Hargroves/EN DES-CEB/5-24-83	

[5] DESCRIPTION OF CONDITION

See Attachment 1 for description

840803F0055 (5)

[6] DATE OF OCCURRENCE EST ( ), ACT. (X) 1976	[9] SIGNIFICANT CONDITION ADVERSE TO QUALITY YES [X] NO [ ]
[7] METHOD OF DISCOVERY	[10] *BRANCH CHIEF/DATE for G. C. Wadett WDE 6/9
[8] UNID CODE (EN DES-EP 8.01)	

[11] CORRECTIVE ACTION

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.

[12] CORRECTIVE ACTION DEVIATES FROM A DESIGN CRITERIA REQUIREMENT YES [ ] NO [ ]	
[13] DESIGN CRITERIA DOCUMENT NO.	EXCEPTION REQUEST NO.
[14] ECN REQUIRED [ ] YES NO [ ] TENNO	[15] SCHEDULE IMPACT [ ] P [ ] A [ ] N

NONCONFORMANCE REPORT

[1] REPORT NO. GENCEB8302 R1

[16] ASSIGNABLE CAUSE (REQUIRED IF SIGNIFICANT)

Incorrect data specifications contained in the user's manual.
Subsequent misuse of program.
Misinterpretation of output.

[17] THIS IS A GENERIC CONDITION YES ☐ NO ☐

[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.

[19] *INDEPENDENT REVIEW: MJK 6/6/83 J. David Lowrey

[20] LABOR EST. ( ), ACT. ( ) MH [21] SCHEDULE EST ( ), ACT ( ) DAYS

[22] ACTIVITY NO.	[23] TASK DESCRIPTION	[24] DATE INITIATED

[25] REMARKS

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
[28] CONST PROJECT MANAGER
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

[26] ALL EN DES ACTION COMPLETE

R O Barnett 7-17-84
*BRANCH CHIEF/ORG. DATE

CEB 840717 006
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.

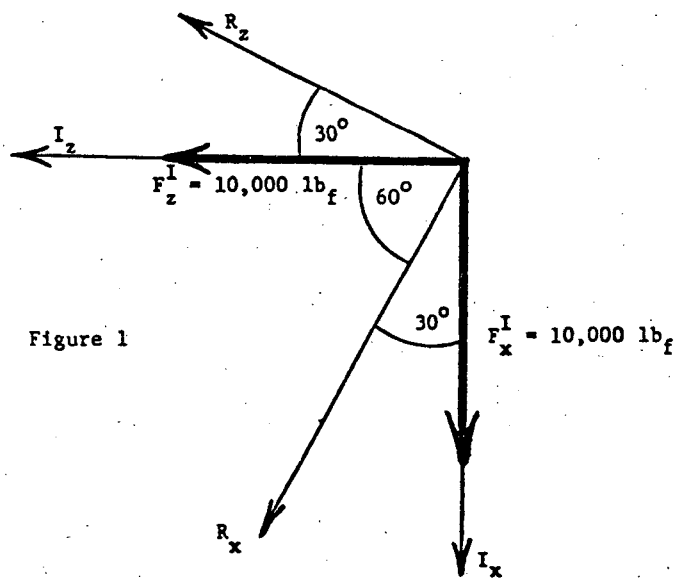


Figure 1

This subtle difference can best be illustrated with an example. Consider a 10,000 lb_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° 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:

$$F_x^R = 13,600, \quad F_z^R = 3,660$$

The ANCHOR manual describes the system relations, relative angles, and direction cosines as:

I_x to R_x	I_x to R_y	I_x to 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:

R_x to I_x	R_x to I_y	R_x to I_z
30°	90°	60°
0.8660	0.0	-0.5000

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.

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

TITLE: IE-79-14 WALKDOWN

	REVISION 0	R6	R7	R8	R9	R10
	DATE 11/15/82	01/04/84				
PREPARED BY:	Fred J. Evans JAT					
INDEPENDENT REVIEW BY:						
SUBMITTED: P&T AQM	KW JAT for SJ					
RECOMMENDED: CEO	R. W. Olson					
APPROVED: QMO						
APPROVED: PMO	Guenter Wadewitz					

TVA

Title: IE-79-14 WALKDOWN

WBNP-QCP-4.56

REVISION LOG

Revision No.	DESCRIPTION OF REVISION	Date Approved
1	Revised to incorporate revisions 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. 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 RQC throughout. Revision bars not shown.	01/04/83

Title: IE-79-14 WALKDOWN	WBNP-QCP- No. 4.56	Rev. 6

1.0 PURPOSE

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

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 Inspection Package--An assembly of drawings pertaining to a specific part of a piping system.

4.2 Discrepancy--Any item found not to conform to the applicable EN DES specifications and/or inspection requirements or is inaccessible to complete inspection.

4.3 Support--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 B001 Pipe Connection--Small branch line connection qualified by B001 support criteria.

5.0 RESPONSIBILITIES

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

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. R6

6.2.5 Note as a discrepancy any as-constructed element of valve installation that does not agree with the design documentation. R6

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.

6.2.12 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 inspection drawing.

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.

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. R6

6.4.4 Note as a discrepancy any as-constructed element of valve installation that does not agree with the design documentation. R6

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.

6.4.7 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.

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 place.

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.

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

9.5 Attachment E-IE-79-14--Individual Support Inspection Data Sheet

IE-79-14 WALKDOWN INSPECTION DATA CARD

WBNP-QCP-4.56
IE-79-14 Walkdown Inspection
Data Card
Test No. 16 Level _____
LOP

Inspection Pkg. Computer Identifier

_____

EN DES Drawing No. and Rev.

_____

Remarks _____ _____

_____

_____

Inspection performed in accordance with Rev. _____ of WBNP-QCP-4.56 and was acceptable.

_____ _____
MQC Inspector Date

_____ _____
HQC Inspector Date

IE-79-14 Inspection Data Sheet For Piping and Valves

Inspection Package Computer ID. _____

Inspection Drawing No. and Rev. _____

1. Piping, Valves, and Penetrations Per Inspection drawing:

   Yes _____ No _____

2. Discrepancies summarized into the following categories:

No. of Piping Geometry	_____	No. of Floor & Wall Penetrations	_____
No. of Additional Fittings	_____	No. of Operator Orientation	_____
No. of Missing Fittings	_____	No. of Potential Interference	_____
No. of Additional Valves	_____	No. of Insulation	_____
No. of Missing Valves	_____	No. of Pipe Property	_____
No. of Mislocated Valves	_____	No. of Miscellaneous	_____

   Test Equipment ID# _____ Cal. Due Date _____

3. Discrepancy tracking number, description, corrective action, inspection test number, and test level update requirements specified by the REU for;

   Discrepancy tracking No. _____

Description	Corrective Action
_____	_____
_____	_____
_____	_____

_____ _____
Engineer Date

Corrective Action Complete and Acceptable

Inspector _____ Date _____

1E-79-14 Inspection Data Sheet for Piping and Valves

Continuation Page

Inspection Package Computer ID. _____
Inspection Drawing No. and rev. _____
3. Continued
Discrepancy Tracking No. _____

Description	Corrective Action

_____ Engineer _____ Date

Corrective Action Complete and Acceptable

Inspector _____ Date _____

Discrepancy Tracking No. _____

Description	Corrective Action

_____ Engineer _____ Date

Corrective Action Complete and Acceptable

Inspector _____ Date _____

Discrepancy Tracking No. _____

Description	Corrective Action

_____ Engineer _____ Date

Corrective Action Complete and Acceptable

Inspector _____ Date _____

Discrepancy Tracking No. _____

Description	Corrective Action

_____ Engineer _____ Date

Corrective Action Complete and Acceptable

Inspector _____ Date _____

IE-79-14 Inspection Data Sheet for Piping and Valves

Final Page

Inspection Package Computer ID. ______________________________

Inspection Drawing No. and Rev. ______________________________

3. Continued

Discrepancy Tracking No. ______________________________

Description	Corrective Action
______________________	______________________
______________________	______________________
______________________	______________________

______________ Engineer ______ Date

Corrective Action Complete and Acceptable

Inspector ________________ Date ________

Discrepancy Tracking No. ______________________________

Description	Corrective Action
______________________	______________________
______________________	______________________
______________________	______________________

______________ Engineer ______ Date

Corrective Action Complete and Acceptable

Inspector ________________ Date ________

Discrepancy Tracking No. ______________________________

Description	Corrective Action
______________________	______________________
______________________	______________________
______________________	______________________

______________ Engineer ______ Date

Corrective Action Complete and Acceptable

Inspector ________________ Date ________

4. Final Acceptance

Inspection performed in accordance with Rev. _____ of WBNP-QCP-4.56 and acceptable

Inspector ________________ Date

IE-79-14 Inspection Data Sheet for Valves

Inspection Package Computer ID. _____

Inspection Drawing No. and Rev.			
Discrepancy Tracking Nos.			
Valve Tag No.			
TVA or W Mark No.			
Valve Drawing No. and Rev.			
Valve Type			
Valve Manufacturer			
Manufacturers Identification No.			
Pipe Size and Material			
Valve Length			
Type of Valve End Connection			
Type of Operator			
Operator Manufacturer			
Operator Identification No.			
Overall Height of Valve (Operator)			
Valve Installation			

Remarks _____

_____

Data Recorder: _____ _____
(Inspector) (Date)

IE-79-14 Inspection Summary Data Sheet for Supports

Inspection Package Computer ID. _____

Inspection Drawing No. and Rev. _____

1. Total Number of Supports _____ Number of Supports Inaccessible _____

2. Number of additional supports _____

3. Number of missing supports _____

4. Support Mark Number and Applicable Discrepancy Tracking Number Listed Below:

Mark No.	Discrepancy No.	Mark No.	Discrepancy No.

5. Discrepancies summarized into the following categories:

No. of Support Location	_____	No. of Spring Size	_____
No. of Restraint Direction	_____	No. of Cotter Keys	_____
No. of Support Type	_____	No. of Component Standard Support Sizes	_____
No. of Structural Members/ Parts	_____	No. of Lug Size	_____
No. of Major Structural Member Size/Length	_____	No. of Clearance	_____
No. of Weld	_____	No. of Damage	_____
No. of Anchor Bolt	_____	No. of Additional Attachments	_____
No. of Bolted Connection(s)	_____	No. of Miscellaneous	_____
No. of Snubber Size/Setting	_____		

IE-79-14 Inspection Summary Data Sheet for Supports

Inspection Package Computer ID. _____

Inspection Drawing No. and Rev. _____

6. Individual support discrepancy data is recorded on attachment E. Discrepancy tracking number, corrective action referencing attachment E, inspection test number and test level update requirements are listed below. When the corrective action is complete and acceptable, the inspector initials and dates under the "acceptable" column for the applicable discrepancy.

Discrepancy No.	Corrective Action	Acceptable Inspector/Date

IE-79-14 Inspection Summary Data Sheet for Supports

Continuation Page

Inspection Package Computer ID. _____

Inspection Drawing No. and Rev. _____

6. Continued

Discrepancy No.	Corrective Action	Acceptable Inspector/Date

IE-79-14 Inspection Summary Data Sheet for Suports

Final Page

Inspection Package Computer ID. _____

Inspection Drawing No. and Rev. _____

6. Continued

Discrepancy No.	Corrective Action	Acceptable Inspector/Date

7. Final Acceptance

Inspection performed in accordance with Rev. _____ of WBNP-QCP-4.56 and was acceptable.

Inspector _____ Date _____

IE-79-14 Individual Support Inspection Data Sheet

Inspection Package Computer ID. _____

Inspection Drawing No. and Rev. _____

Support Identifier (WBNP-QCI-1.40) _____

Support Drawing No. and Rev. _____

Discrepancy Tracking No. _____

1. Support Inspection Checklist

Support Relative Location Correct: Yes _____ No _____

Restraint Installed Direction Correct: Yes _____ No _____

Support Type Correct: Yes _____ No _____

Structural Members/Parts Installed: Yes _____ No _____

Major Structural Member Size/Length: Size _____ Length _____

Specified Welds made: Yes _____ No _____

Anchor Bolts Installed: Yes _____ No _____ N/A _____

Bolted Connections Acceptable: Yes _____ No _____ N/A _____

Snubber Size/Setting Correct: Yes _____ No _____ N/A _____

Spring Can Size Correct: Yes _____ No _____ N/A _____

Cotter Keys Installed: Yes _____ No _____ N/A _____

Component Standard Support Sizes Correct: Yes _____ No _____ N/A _____

Lug Size Correct: Yes _____ No _____ N/A _____

Clearances Correct: Yes _____ No _____ N/A _____

Record Actual Clearance: Vertical: Top _____ in., Bottom _____ in.

Axial: _____ in., Lateral: Total Gap _____ in.

Support Damaged: Yes _____ No _____

Additional Attachments(s) To Support: Yes _____ No _____ N/A _____

Miscellaneous (Describe): _____

_____

_____

IE-79-14 Individual Support Inspection Data Sheet

Inspection Package Computer ID. _____

Inspection Drawing No. and Rev. _____

Support Identifier (WBNP-QCI-1.40) _____

Discrepancy Tracking No. _____

2. Describe below each discrepant condition on this support.

_____

_____

_____

_____

_____

3. Describe below corrective action required to rectify each discrepant condition. Specify inspection test number(s) and test level update requirements for the support identifier.

_____

_____

_____

_____

_____

_____ _____
Engineer Date

4. Corrective Action Complete and Acceptable.

_____ _____
Inspector Date

5. Final Acceptance

Inspection performed in accordance with Rev. _____ of WBNP-QCP-4.56 and was acceptable.

Inspector _____ Date _____

TVA Task Force for Review of Black & Veatch Findings

EVALUATION SHEET

Rev. R2
Date 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.

AJ Resp. Org. WBP 7/20/83 A. Jonsson 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.

AJ Resp. Org. WBP 7/20/83 A. Jonsson 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 inadequate.

Resp. Org. WBP A. Tondon 1/31/84 AJ ~~7/20/83~~ Task Force Concurrence 1/31/84 7/20/83

AJ

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.

AJ Resp. Org. WBP A. Tondon 7/20/83 Task Force Concurrence 7/20/83

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.

AJ Resp. Org. WBP A. Tondon 7/20/83 Task Force Concurrence 7/20/83

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.

AJ Resp. Org. WBP 7/20/83 A. Tonsoon Task Force Concurrence 7/20/83

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 A. Tonsoon Task Force Concurrence 7/20/83

10A. Identification of Corrective Action for Future Work

A. Preliminary

Plan in 9AA appears adequate.

B. Final

Plan in 9A is adequate.

Resp. Org. WBP 7/20/83 A. Tonsoon Task Force Concurrence 7/20/83

11A. Implementation of Corrective Action for Future Work

A. Preliminary

B. 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. Org. A. Tourson 12/7/83 Task Force Concurrence 12/5/83

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 16, 1984 (QMS 841116 202).

Resp. Org. 11-30-84 Task Force Concurrence 12/31/84

6B. Identification and Evaluation of Ongoing Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. / / Task Force Concurrence / /

7B. Identification of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

8B. Implementation and Inspection of Corrective Action for Completed Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

9B. Identification and Evaluation of Ongoing Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / Task Force Concurrence _____ / /

10B. Identification of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / _____ Task Force Concurrence _____ / / _____

11B. Implementation of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / _____ Task Force Concurrence _____ / / _____

12B. Verification of Effectiveness of Corrective Action for Future Work

A. Preliminary

N/A

B. Final

Resp. Org. _____ / / _____ Task Force Concurrence _____ / / _____

TVA 64 (08-9-85)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

QMS '841116 202

8411290351 (6)

TO : Quality Management Staff Files

FROM : J. W. von Weisenstein, 384 SPB-K

DATE : NOV 16 1984

SUBJECT: ASSESSMENT OF ADEQUACY 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."

J. W. von Weisenstein

JvW:MBP
Attachments
cc: 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 (7706)

11/16/84 - EGB:MBP
cc (Attachments):
R. O. Barnett, W9D224 C-K
D. B. Bowen, W11A8 C-K
R. W. Cantrell, W11A9 C-K
G. F. Dilworth, W11A12 C-K
MEDS, W5B63 C-K
J. C. Standifer, P-104 SB-K

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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: Daryl Perkey
Date: 11-5-87

Approved By: [signature]
Date: 11-5-87

==========

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 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:

1. 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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