QUALITY
TECHNOLOGY
COMPANY

P.O. BOX 600 Sweetwater, TN 37874 (615)365-4414

ERT INVESTIGATION REPORT

CONCERN NO: WI-85-035-007

CONCERN: Welder made many welds on instrumentation sensing lines but was not certified in the welding process used to make these welds. These occurred during the time period from 1981 to 1983. Instrument sensing lines located in Unit 1 side of Aux and Turbine Building. Concern that weld documentation for these welds was post dated to show welder was certified when welds were made.

INVESTIGATION
PERFORMED BY: William Kemp, Jr.

DETAILS

SPECIFICS OF THE CONCERN:

1) Stainless steel socket welds
2) Procedure used, GT 88-0-1 R6

DOCUMENTS REVIEWED:

Welder "X" Qualification Records
Renewal Cards
Welding Procedure GT 88-0-1 - Rev. 6
Procedure Specification 1.M.1.2-3,4,10,11,12,13,14,15
Basic Joint Types
QCI 4.02 - Welder and Welding Operator Performance Qualification
(Applicable Revs)

PERSONNEL CONTACTED: (CONFIDENTIAL)

SUMMARY OF INVESTIGATION

This concern is not substantiated.

Based on the review of welder "X's" qualification and renewal records, this welder while employed at Watts Bar, was qualified to GT 88-0-1 and was qualified to weld stainless steel socket welds per Process Specification 1.M.1.2-11 R6, Basic Joints Types.

CONCERN NO: WI-85-035-007

DETAILS, continued

Welder X's qualifications were verified using the following documentation:

1) Welder performance qualification records
2) Welder qualification cards
3) Welder qualification renewal cards
4) WPQ historical records (computer readout)

It is noted that if a welder renewal is "backdated" it is noted on the renewal card. Welder "X's" renewal card had no evidence of backdating, and the certifications were kept updated, while employed by TVA.

CONCLUSION:

This concern is not substantiated.

Based on this investigation, welder "X" was qualified to weld stainless steel socket welds per GT 88-0-1 during the time frame 1981 to 1983 on the instrument sensing lines in Unit 1 Aux. and Turbine Generator Building.

Accepted by
Bruce L. Siegling
1-24-86

PREPARED BY DMKempf 1/21/86
DATE

REVIEWED BY OL Thero 1/21/86
DATE

FINAL

REQUEST FOR REPORTABILITY EVALUATION

[redacted]st No. WI-85-035-007 _____
(ERT Concern No.) (ID No., if reported)

[redacted]ification of Item Involved: Welder Certification
(Nomenclature, system, manuf., SN, Model, etc.)

[redacted]iption of Problem (Attach related documents, photos, [redacted]hes, etc.)
[redacted]r made welds on instrumentation sensing lines in Auxiliary and turbine [redacted]ator building and was not qualified.

[redacted]n for Reportability: (Use supplemental sheets if necessary)

[redacted]This design or construction deficiency, were it to have [redacted]emained uncorrected, could have affected adversely the safety [redacted]f operations of the nuclear power plant at any time throughout [redacted]he expected lifetime of the plant.

[redacted]No ___X___ Yes _____ If Yes, Explain: _____

[redacted]OND
[redacted]This deficiency represents a significant breakdown in any [redacted]portion of the quality assurance program conducted in [redacted]ccordance with the requirements of Appendix B.

[redacted]No ___X___ Yes _____ If Yes, Explain: _____

[redacted]OR
[redacted]This deficiency represents a significant deficiency in final [redacted]esign as approved and released for construction such that the [redacted]esign does not conform to the criteria bases stated in the [redacted]afety analysis report or construction permit.

[redacted]No ___X___ Yes _____ If Yes, Explain: _____

[redacted]OR

REQUEST FOR REPORTABILITY EVALUATION

D. This deficiency represents a significant deficiency in construction of or significant damage to a structure, system or component which will require extensive evaluation, extensive redesign, or extensive repair to meet the criteria and bases stated in the safety analysis report or construction permit or to otherwise establish the adequacy of the structure, system, or component to perform its intended safety function.

No X Yes _____ If Yes, Explain: ____________________

____

____

OR

E. **This deficiency represents a significant deviation from the performance specifications which will require extensive evaluation, extensive redesign, or extensive repair to establish the adequacy of the structure, system, or component to perform its intended safety function.**

No X Yes _____ If Yes, Explain: ____________________

____

____

IF ITEM 4A, AND 4B OR 4C OR 4D OR 4E ARE MARKED "YES", IMMEDIATELY HAND-CARRY THIS REQUEST AND SUPPORTING DOCUMENTATION TO NSRS.

This Condition was Identified by: O L Thero 365-4464
ERT Group Manager Phone Ext.

O L Thero for 365-4414
ERT Project Manager Phone Ext.

Acknowledgment of receipt by NSRS

Bruce L. Siefken Date 1-24-85 Time 15:47
Signed

ERT Form M

TVA 64 (OS-9-85) (OP-WP-5-85)

NRC

UNITED STATES GOVERNMENT

Memorandum TENNESSEE VALLEY AUTHORITY

TO: W. T. Cottle, Site Director, Watts Bar Nuclear Plant

FROM: K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

DATE: JAN 28 1986

SUBJECT: CORRECTIVE ACTION RESPONSE EVALUATION

REPORT NO. : IN-85-460-X05

SUBJECT : EXCAVATION OF AN ARC STRIKE

CONCERN NO.: IN-85-460-X05

( ) ACCEPT (X) REJECT

NSRS has evaluated the response to IN-85-460-X05 dated January 14, 1986. The summary of our evaluation is stated below.

Q-85-460-X05-01 - NSRS agrees that an NCR was not required by QCP-4.10; however, an NCR was required by the Watts Bar QA program in WBNP-QCI-1.2, R1, which was in effect at the time of the arc-strike removal. The verbal approval by Design itself implies that the minimum wall as .064". As a result of this investigation, Design performed calculations for this arc-stike removal (5 years after the removal), and these documented calculations (RIMS B26 850808 014) show the minimum wall required to be .090", not the .064" as stated at the time of the arc-strike removal.

Q-85-460-X05-02 - Documentation of the reduced section thickness would be accomplished through Design if an NCR had been generated.

Q-85-460-X05-03 - NSRS agrees with the action taken on this recommendation except for the two items that were below the manufacturer's minimum wall but above design minimum. These should be documented for the same reasons as stated above in Q-85-460-X05-01.

Q-85-460-X05-04 - This response is acceptable.

for K. W. Whitt

RLN:JTH
cc (Attachment):
R. P. Denise, LP6N40A-C
D. R. Nichols, E10A14C-K
QTC/ERT, CONST-WBN
E. K. Sliger, LP6N48A

Principally prepared by R. L. Newby.

3320U

TVA 64 (08-9-85)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

TO : K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

FROM : W. T. Cottle, Site Director, Watts Bar Nuclear Plant P&E (Nuclear)

DATE : JAN 14 1986

SUBJECT: WATTS BAR NUCLEAR PLANT - RESPONSE TO EMPLOYEE CONCERN INVESTIGATION REPORT TRANSMITTAL

Transmitted herein is Construction's response to recommendations Q-85-460-X05-01, 02, 03 and 04 contained in the Nuclear Safety Review Staff (NSRS) employee concern investigation report IN-85-460-X05.

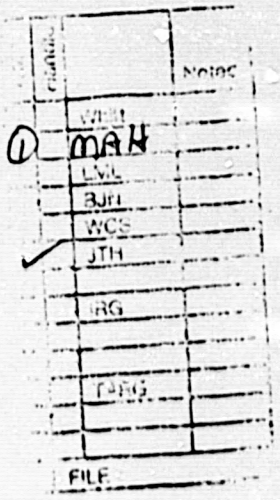
If you have any questions, please contact W. L. Byrd or J. R. Inger at 3774, Watts Bar Nuclear Plant P&E (Nuclear).

WLByrd for
W. T. Cottle

WLB:JRI:NC
Attachment

This memorandum was principally prepared by J. R. Inger. JAN 15 '86

1/22/86--JTH
cc (Attachment):
P. R. Washer, NSRS--For evaluation



Recommendations:

Q-85-460-X05-01 - Arc Strike NCR - Document this arc strike removal on an NCR (including profile of the material section), and obtain formal OE disposition and approval of the minimum wall calculations and surface profile.

Q-85-460-X05-02 - Deviation from Drawing Requirement - Ensure that "as-constructed" drawings show the deviation from drawing requirements (SA312 schedule 40 pipe was specified by OE on the drawings and bill of materials).

Q-85-460-X05-03 - Review for Generic Application - Review all arc strike removal sheets and determine if required NCRs were initiated for conditions which did not meet the material specifications but did meet minimum design wall specifications. Initiate NCRs for any identified violations.

Q-85-460-X05-04 - Clarification of QCP-4.10-18 - Revise WBN-QCP-4.10-18 Paragraph 6.4.3 to clarify that the wall thickness minimum requirement is that of the material specification. Violation of this require design approval to use as is based on design minimum wall calculations, Paragraph 6.4.3.3.

Response:

Q-85-460-X05-01 - WBNP-QCP-4.10 Appendix K (standard instruction No. 63 arc strike removal) which was the procedure in effect at the time only was applicable to class I components of ASME Section III. The arc strike in question which was on class B material used the arc strike removal sheet to document and verify that the design minimum wall thickness was not violated. Since design minimum wall thickness was not violated a design discrepancy did not exist and a NCR was not required per this procedure in effect at this time.

Q-85-460-X05-02 - There is no requirements to put deviations of manufacturer's minimum wall tolerances on as-constructed OE drawings.

Q-85-460-X05-03 - There were 497 arc strike removal sheets reviewed of which 260 did not have associated NCRs. Two (2) of the 260 documents had arc strikes on class B pipe below manufacturers minimum wall but above design minimum wall. During the review two (2) other arc strike removal sheets on class A pipe did not record the depth of the arc strikes. NCR 6538 was initiated to document this condition. WBN-OC does not feel that a generic condition exist since only two (2) discrepancies were found from a review of 497 documents. NCRs were not initiated for the two (2) items that were below manufacturers minimum wall but above design minimum wall per reasons stated in response to recommendations Q-85-460-X05-01.

Q-85-460-X05-04 - WBM-QCP-4.10-18 Sections 4.0, 6.4.3 and Attachment A is being revised to clarify minimum wall requirements. Revision to Section 4.0 will add definitions of minimum and design wall thickness. Section 6.4.3 will read "If the wall thickness is below material specifications per ASME Section II", Attachment "A" will add a place to record design minimum wall thickness when applicable and obtained by NCR resolution from design.

TVA 64-(OS-9-65) (OP-WP-5 35)

NRC

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

TO: W. T. Cottle, Site Director, Watts Bar Nuclear Plant

FROM: K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

DATE: JAN 29 1986

SUBJECT: CORRECTIVE ACTION RESPONSE EVALUATION

REPORT NO. : IN-85-031-001

SUBJECT : EVALUATION OF EMBEDDED PLATES

CONCERN NO.: IN-85-031-001

( ) ACCEPT (X) REJECT

Please refer to W. T. Cottle from K. W. Whitt memorandum dated January 24, 1986.

K. W. Whitt

GDM
Attachment
cc (Attachment):
R. P. Denise, LP6N40A-C
D. R. Nichols, E10A14C-K
QTC/ERT, CONST-WBN
E. K. Sliger, LP6N48A

9324U

TVA 64 (08-8-85)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

TO : W. T. Cottle, Site Director, Watts Bar Nuclear Plant P&E (Nuclear)

FROM : K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

DATE : January 24, 1986

SUBJECT: NSRS EVALUATION OF TVA LINE RESPONSE TO IN-85-31-001

Please refer to J. C. Standifer memorandum dated January 2, 1986, Watts Bar Nuclear Plant - Evaluation of Embedded Plates - ERT Report No. IN-85-31-001 - Response.

The conclusions stated in Paragraphs 2.3 and 3.3 are to accept the results of the samples if no embedded plates are identified which require physical modification. NSRS finds these conclusions unacceptable. Any evaluation which does not meet the original acceptance criteria should be considered as a failure. Failures would then require enlarging the sample size and/or reevaluation of all affected EP-FCRs.

Paragraph 4.2.1 - TVA Response 1

OE's present procedure describing the approval of EP-FCRs by inspection does not comply with 10CFR50 Appendix B, Criterion V, "Instructions, Procedures and Drawings." Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings which include appropriate quantitative and qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished. The procedure also does not meet the intent of Criterion III on design control including field changes. NSRS has determined that procedure revision is required to develop a more useable procedure and one that will avoid future controversy.

K. W. Whitt

DRB:BRP

cc: R. P. Denise, LP6N35A-C
D. R. Nichols, E10A14 C-K
E. K. Sliger, LP6N48A-C
QTC, WBN-CONST

Principally prepared by D. R. Bradley.

TVA 64 (OS-9-65) (OP-WP-5-85)

NRC

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

TO: W. T. Cottle, Site Director, Watts Bar Nuclear Plant

FROM: K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

DATE: JAN 29 1986

SUBJECT: NUCLEAR SAFETY REVIEW STAFF INVESTIGATION REPORT TRANSMITTAL

Transmitted herein is NSRS Report No. I-85-623-WBN

Subject FIELD CHANGE REQUESTS

Concern No. IN-85-279-002, IN-85-279-003, and IN-86-232-X03

and associated recommendations for your action/disposition.

It is requested that you respond to this report and the attached recommendations by February 25, 1986. Should you have any questions, please contact A. M. Gentry at telephone 3777-WBN.

Recommend Reportability Determination: Yes ____ No X

Director, NSRS/Designee

AMG:GDM
Attachment
cc (Attachment):
R. P. Denise, LP6N40A-C
D. R. Nichols, E10A14 C-K
QTC/ERT, Watts Bar Nuclear Plant
E. K. Sliger, LP6N48A-C

--Copy and Return--

To : K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

From: _____

Date: _____

I hereby acknowledge receipt of NSRS Report No. I-85-623-WBN
Subject FIELD CHANGE REQUESTS for action/disposition.

_____ _____
Signature Date

0331U

TENNESSEE VALLEY AUTHORITY

NUCLEAR SAFETY REVIEW STAFF

NSRS INVESTIGATION REPORT NO. I-85-623-WBN

EMPLOYEE CONCERNS IN-85-279-002, IN-85-279-003, AND IN-86-232-X03

MILESTONES 1

SUBJECT: FIELD CHANGE REQUESTS

DATES OF INVESTIGATION: October 17-December 18, 1985

LEAD INVESTIGATOR: A. M. Gentry — Date: 1-23-86

INVESTIGATOR: J. J. Knightly — Date: 1-23-86

REVIEWED BY: for J. D. Smith — Date: 1/23/86

APPROVED BY: for M. A. Harrison — Date: 1/23/86

I. BACKGROUND

NSRS has investigated three employee concerns, described below, which the Quality Technology Company (QTC) Employee Response Team had identified during the Watts Bar Employee Concern Program that stated:

IN-85-279-002

FCRs are written to correct NCR concern before NCR is dispositioned then the NCR is voided due to FCR correcting NCR concern. FCRs and NCRs do not have same approval route.

IN-85-279-003

FCRs are misincorporated onto Dwgs. Instead of an NCR being written to identify the discrepancy, another FCR is written per procedure. However, months can elapse before 2nd FCR is written and work/inspection are performed to invalid data.

IN-86-232-XQ3

FCRs are not approved by Design Engineering prior to installation and insoection, causing alot of confusion and rework. Construction dept concern.

II. SCOPE

The investigation was conducted by reviewing applicable requirements, commitments, and procedures; interviewing site construction engineering and inspection personnel; reviewing field change requests (FCRs) and nonconformance reports (NCRs); and interviewing Office of Engineering (OE) personnel.

III. SUMMARY OF FINDINGS

A. Applicable Requirements, Commitments, Procedures, and Documents Reviewed

1. Construction Procedure WBNP-QCI-1.13, Revisions 10-13, "Preparation and Documentation of Field Change Requests"

2. Construction Procedure WBNP-QCI-1.02, "Control of Nonconforming Items"

3. Construction NCR Log

4. Construction FCR Logs

5. WBNP Quality Trend Analysis Reports, March through September 1985

6. Engineering Procedure OEP-11, "Change Control"

7. Engineering Procedure OEP-08, "Design Output"

8. Engineering Procedure OEP-17, "Corrective Action

9. Engineering Procedure OEP-10, "Review"

B. WBNP-QCI-1.13 was reviewed with the following requirements being noted.

1. The responsible engineering unit (REU) initiates and obtains approvals for FCRs. Approvals include the design project engineer (verbal approval), unit supervisor, Construction Engineer, and Project Manager. The preparation of an FCR includes preparing marked drawings and supplemental sketches. Upon approval, all information is sent to the design project engineer.

2. Telephone approval from the design project engineer is considered permission to proceed with work.

3. Holders of affected drawings are notified of the FCR, and copies of FCRs are distributed to holders of affected work packages.

4. The FCR is processed by OE in accordance with OE procedures. If the FCR is approved, it is incorporated in the appropriate design document (specification, drawings, etc.) with an engineering change notice (ECN) and issued for use. If the FCR is not approved, it is returned to the originator and an acceptable resolution worked out.

5. When the revised document which incorporates an FCR reaches the site, it is reviewed by the REU to verify that the FCR was properly incorporated. If the FCR has been properly incorporated, this verification is documented on the Document Control Unit (DCU) log. If the FCR has not been properly incorporated, the REU revises the FCR or issues a new FCR to correct the discrepancy.

6. It was observed in Revisions 6 through 9 of QCI-1.13 that if a discrepancy was noted between the FCR and revised drawing, it was documented on a nonconformance report (NCR). Beginning with Revision 10, the procedure was revised to delete the NCR requirement and to initiate the process described in Paragraph 5 above. This lessened the visibility of any errors made incorporating FCRs.

C. The NCR log was reviewed to determine if any NCRs had been written to document FCRs that were not properly incorporated into revised drawings or other design documents. There were 48 NCRs noted between April 1982 and November 1984 that dealt with FCRs not being properly incorporated. With two exceptions, the disposition of these NCRs was to correct errors, omissions, or discrepancies found on the design drawings. It was also noted that since the procedure was changed to require a second FCR instead of an NCR, there has been a significant increase in the quantity of FCRs written. Interviews with CONST personnel indicated that a number of these FCRs were for correcting an FCR incorporation error.

D. The WBN Office of Construction (OC) Quality Manager's Staff (QMS) was contacted to determine if OC had upgraded any NCRs to "significant" based on the quantity of repetitive problems. A significant NCR would have required remedial action and action to prevent recurrence. No significant NCRs were noted.

E. The OE Quality Manager's Staff was contacted to determine if any action had been taken in this area to correct this repetitive problem. It was indicated that at one point in time the problems discussed in Paragraph C were addressed by NCRs. A programmatic change directed by OE management was made to allow correction of an error by a second FCR instead of writing an NCR. If OE receives an FCR which is correcting an error, they are required to write a problem identification report (PIR). The PIR is trended by QMS; however, there was no indication that PIRs were being written by OE personnel. It was also indicated that the change was made to lessen the visibility of engineering problems: i.e., no nonconformances written.

F. No evidence was found to indicate that FCRs were written to resolve an NCR and the NCR subsequently voided. However, while reviewing inspection rejection notices (IRN - a form of a nonconformance report - see NSRS Report I-85-443-WBN), it was noted that this type of situation had occurred in at least one instance. IRN H-TEA-178 was written 7/17/85 and stated that (1) an FCR was needed to show hanger located on structural steel; and, (2) no locking device was found on the clamp bolts. In the "Reinspection" portion of the form, it was noted that an FCR had been issued previously to support inspection and that item (1) on the IRN had been lined through on 7/23/85.

The reason this situation was noted was because of the wording of the concern and the interpretations that were rendered by CONST personnel interviewed who used the term nonconformance to include NCRs and IRNs. In the CONST inspection arena any item which is inspected and found unacceptable is considered a nonconformance. The method in use by CONST to document a nonconformance at this point in the construction process is to write an IRN. It is possible, and frequently happens, that the terms nonconformance and NCR get interchanged. It is possible that this could have happened in the conveyance of this concern.

IV. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

A. Concern IN-85-279-002 was substantiated based on the probability that NCR and IRN terminology could have been interchanged. It is mitigated by the fact that the one case noted appears to be an isolated incident.

B. Concern IN-85-279-003 was substantiated.

C. Concern IN-86-232-X03 was not substantiated since FCRs are verbally approved prior to the work being done.

Recommendations

I-85-623-WBN-01 - Revise QCI-1.13

Revise the construction FCR procedure to require that when an FCR is written to correct an incorporation error, the FCR will include a statement that "this FCR is being written to correct an error while incorporating FCR ____."

I-85-623-WBN-02 - QE Review Design Control

QE should review the design control process to determine why errors have been repetitive.

I-85-623-WBN-03 - QE Review PIRs

QE should investigate why PIRs are not being written and take action to correct.

TVA 64 (OS-9-65) (OP-WP-5-85)

UNITED STATES GOVERNMENT

Memorandum TENNESSEE VALLEY AUTHORITY

TO: W. T. Cottle, Site Director, Watts Bar Nuclear Plant

FROM: K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

DATE: JAN 29 1986

SUBJECT: NUCLEAR SAFETY REVIEW STAFF INVESTIGATION REPORT TRANSMITTAL

Transmitted herein is NSRS Report No. I-85-338-WBN

Subject RHR PUMP MOTOR MODIFICATIONS

Concern No. IN-85-864-002

and associated recommendations for your action/disposition.

It is requested that you respond to this report and the attached recommendations by February 25, 1986. Should you have any questions, please contact A. M. Gentry at telephone 3777-WBN.

Recommend Reportability Determination: Yes X No ____

Director, NSRS/Designee

AMG:GDM
Attachment
cc (Attachment):
R. P. Denise, LP6N40A-C
D. R. Nichols, E10A14 C-K
QTC/ERT, Watts Bar Nuclear Plant
E. K. Sliger, LP6N48A-C

--Copy and Return--

To : K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

From: _____

Date: _____

I hereby acknowledge receipt of NSRS Report No. I-85-338-WBN
Subject RHR PUMP MOTOR MODIFICATIONS for action/disposition.

_____ Signature _____ Date

3250

TENNESSEE VALLEY AUTHORITY

NUCLEAR SAFETY REVIEW STAFF

NSRS INVESTIGATION REPORT NO. I-85-338-WBN

EMPLOYEE CONCERN IN-85-864-002

MILESTONE 6

SUBJECT: RHR PUMP MOTOR MODIFICATIONS

DATES OF INVESTIGATION: December 5, 1985-January 9, 1986

LEAD INVESTIGATOR: A. M. Gentry — Date: 1-21-86

INVESTIGATOR: J. J. Knightly — Date: 1-21-86

REVIEWED BY: J. D. Smith — Date: 1/23/86

APPROVED BY: M. A. Harrison — Date: 1-23-86

I. BACKGROUND

NSRS has investigated the following employee concern identified by the Quality Technology Company (QTC) during the Watts Bar Employee Concern Program that stated:

> Modifications were made to the RHR pump motors in Unit #2 (ie electrical connections were converted to water tight) which may not have been made in Unit #1.

II. SCOPE

The investigation was conducted by reviewing applicable requirements and commitments, interviewing cognizant Construction and Nuclear Power personnel, and by physical evaluation of the pump motors.

III. SUMMARY OF FINDINGS

A. Interviews with CONST personnel and the review of related documentation indicated that the modifications to the Unit 2 RHR pump motors were for the installation of Raychem Nuclear Plant splice kits. These splice kits are used for insulation and sealing of electrical cable connections. The work on Unit 2 was completed on 5/30/85 and 6/3/85 on Work Release 23572.

B. Nonconforming Condition Report (NCR) 6208 was issued 7/24/85 and identified cable terminations in Unit 2 that did not have splice kits installed. As a result of this NCR, Office of Engineering (OE) will evaluate design documents and identify which connections require Raychem and which require just Class 1E material and the application of the taping method currently used. Any corrections will be accomplished by Office of Construction (OC) Electrical Engineering Unit (EEU).

C. As a result of NCR 6208, NCR 6224 was written 8/1/85 to address the same situation as described above which exists in Unit 1. Any connections in Unit 1 will be handled by Nuclear Services Branch (NSB). Workplans are in process to perform the required rework. At the time of this investigation, the Unit 1 RHR pump motors had not been reterminated using the Raychem splice kit.

D. The apparent cause of these nonconforming conditions was drawings defining harsh environment areas were not issued until 8/26/83. Many equipment installations and cable terminations were made prior to this. It was also indicated that drawings were somewhat ambiguous which led to the misinterpretation of the drawing requirements and the areas covered. OE has committed to revising drawings to clarify requirements and to provide OC with a list of Class 1E equipment requiring Raychem terminations.

IV. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The employee concern is substantiated.

Recommendations

I-85-338-WBN-01 - OE Issue Drawings

Confirm that all required OE drawing revisions have been completed and issued.

I-85-338-WBN-02 - OE Review Related Drawings

OE should review all Class 1E related drawings and provide clarifications as required.

I-85-338-WBN-03 - OE Provide 1E List

Confirm that OE has provided OC with the list of Class 1E equipment requiring Raychem.

I-85-338-WBN-04 - Complete Reterminations

Confirm that all required reterminations have been completed.

I-85-338-WBN-05 - OE Provide ARPR

Action to prevent recurrence should be identified by OE since the root cause of the nonconformance is the OE design drawings.

TVA 64 (OS-9-65) (OP-WP-5-85)

NRC

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

TO: H. L. Abercrombie, Site Director, Sequoyah Nuclear Plant

FROM: K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

DATE: JAN 29 1986

SUBJECT: NUCLEAR SAFETY REVIEW STAFF INVESTIGATION REPORT TRANSMITTAL

Transmitted herein is NSRS Report No. I-85-241-SQN

Subject HUMAN FACTORS CONTROL ROOM DESIGN REVIEW

Concern No. XX-85-122-020

The attached report contains one Priority 3 [P3] recommendation which requires you to take some form of investigative, follow-up or corrective action within a specified time frame. Please refer to recommendation I-85-241-SQN-01 for details. No formal response is required for this report. Please provide the requested information when completed. Should you have any questions, please contact R. C. Sauer at telephone 2277.

Recommend Reportability Determination: Yes ____ No X

Director, NSRS/Designee

RCS:JTH
Attachment
cc (Attachment):
R. P. Denise, LP6N40A-C
R. J. Griffin, SQN E-18
G. B. Kirk, SQN
D. R. Nichols, E10A14 C-K
QTC/ERT, Watts Bar Nuclear Plant
Eric Sliger, LP6N48A-C
J. H. Sullivan, SQN

330U

TENNESSEE VALLEY AUTHORITY

NUCLEAR SAFETY REVIEW STAFF

NSRS INVESTIGATION REPORT NO. I-85-241-SQN

EMPLOYEE CONCERN: XX-85-122-020

SUBJECT: HUMAN FACTORS CONTROL ROOM DESIGN REVIEW

DATES OF INVESTIGATION: DECEMBER 18-19, 1985

INVESTIGATOR: N. T. Henrich — N. T. HENRICH — 1/16/86 — DATE

REVIEWED BY: M W Alexander — M. W. ALEXANDER — 1/16/86 — DATE

APPROVED BY: R. C. Sauer — R. C. SAUER — 1/27/86 — DATE

I. BACKGROUND

A Nuclear Safety Review Staff (NSRS) investigation was conducted to determine the validity of an expressed employee concern as received by the Quality Technology Company (QTC)/Employee Response Team (ERT). The concern of record, as summarized on the Employee Concern Assignment Request Form from QTC and identified as XX-85-122-020, stated:

> Sequoyah: Human Factors engineering and/or reviews have not been implemented for control panels and stations. CI expressed that this is a violation of NUREG-0700. CI further stated that there are too many poor engineering practices in this area. CI has no further information. Anonymous concern via letter.

II. SCOPE

A. The scope of this investigation was determined from the stated concern of record to be that of two specific issues requiring investigation:

1. The SQN Human Factors Control Room Design Review specified in NUREG-0700 has not been implemented.

2. A significant number of poor engineering practices exist in the application of human engineering principles to the SQN control panels.

B. To accomplish this investigation, a review of regulatory requirements and TVA commitments for conducting the control room design review (CRDR) was conducted. This included applicable regulatory documents and the TVA CRDR program plan. Interviews with individuals cognizant of SQN CRDR activities were also conducted to determine the nature and extent of activities in this area. Finally, a review was conducted of TVA engineering procedures which govern the application of human engineering principles in the design, layout, and modification of SQN control room panels.

III. SUMMARY OF FINDINGS

A. Requirements and Commitments

1. NUREG-0737, "Clarification of TMI Action Plan Requirements," Task I.D.1 (Ref. 2).

2. Letter from L. M. Mills (TVA) to A. Schwencer (NRC) committing SQN to implement the requirements of NUREG-0737 Task I.D.1 (Ref. 3).

3. NUREG-0737, Supplement 1, "Requirements for Emergency Response Capability (Generic Letter 82-33)," Section 5 (Ref. 5).

4. Letter from L. M. Mills (TVA) to Ms. E. Adensam (NRC) committing SQN to a control room design review implementation schedule (Ref. 6).

5. Letter from E. G. Adensam to H. G. Parris dated June 15, 1984, issuing a confirmatory order of November 1986 for submission of a summary report of the completed control room design review (Ref. 7).

B. Findings

1. NUREG-0737 (Ref. 2) was transmitted to TVA by reference 1 on October 31, 1980. Task I.D.1 of this NUREG required a detailed control room design review (CRDR) be conducted to identify and correct any human engineering deficiencies. This review was to use NRC guidelines on how to conduct a CRDR (NUREG-0700) once they were issued. No implementation schedule was given in task I.D.1. The transmittal letter (Ref. 1) required TVA to confirm its commitment to implement the CRDR requirements as defined in Task I.D.1.

2. By reference 3, TVA committed to perform a detailed CRDR at SQN using NRC guidelines when they became available. These guidelines would form the basis for conducting the review.

3. NUREG-0737, Supplement 1, was transmitted to TVA by D. G. Eisenhut (NRC) on December 17, 1982, by reference 4. Section 5 of this supplement sets forth the following requirements for conducting the CRDR:

   a. The establishment of a qualified multi-disciplinary review team and a review program incorporating accepted human engineering principles.

   b. The use of function and task analysis to identify control room operator tasks and information and control requirements during emergency operations.

   c. A comparison of the display and control requirements with a control room inventory to identify missing displays and controls.

   d. A control room survey to identify deviations from accepted human factors principles. This survey will include, among other things, an assessment of the control room layout, the usefulness of audible and visual alarm systems, the information recording and recall capability, and the control room environment.

e. Assess which human engineering discrepancies are significant and should be corrected. Select design improvements that will correct those discrepancies.

f. Verify that each selected design improvement will provide the necessary correction and can be introduced in the control room without creating any unacceptable human engineering discrepancies because of significant contribution to increased risk, unreviewed safety questions, or situations in which a temporary reduction in safety could occur.

g. The submittal of a summary report of the completed review outlining proposed control room changes, including their proposed schedules for implementation. The report will also provide a summary justification for human engineering discrepancies with safety significance to be left uncorrected or partially corrected. In addition, NRC required submittal of a CRDR program plan describing how TVA intended to meet these requirements and a proposed schedule for completion of the SQN CRDR.

4. On April 15, 1983 (Ref. 6), TVA committed to implement a SQN CRDR as outlined in the TVA-developed CRDR program plan. This submittal included a proposed schedule for completion of CRDR activities and was contingent on the availability of new, validated, symptom-oriented emergency operating procedures required by NUREG-0737 Task I.C.1.

5. The TVA-developed CRDR program plan is applicable to all nuclear plants. This program plan was issued as Special Engineering Procedure SEP 82-17 (Ref. 9a) and was transmitted to NRC on June 9, 1983, by reference 10. The TVA CRDR program plan described the main elements of the human engineering efforts to identify and correct deficiencies in design and operation of TVA nuclear power plants. Guidance was provided to TVA personnel responsible for planning, conducting, and reporting detailed control room design reviews and for recommending appropriate followup corrective actions related to the human engineering discrepancies revealed in the detailed review. The program plan also was intended to ensure compliance with pertinent NRC directives and guides, specifically NUREG-0700.

6. On June 15, 1984, NRC issued a confirmatory order for the completion of the SQN CRDR including submittal of a summary report of the completed review by November 1986 (Ref. 7).

7. NUREG-0700 (Ref. 8) provided guidance NRC believes should be followed to accomplish a CRDR. It does not define a regulatory requirement. In fact, NUREG-0700 allows alternate approaches, methods, and reporting procedures which may differ from the published guidance provided adequate justification is provided.

8. NRC reviewed the TVA CRDR program plan and provided comments on December 23, 1983 (Ref. 11). TVA responses to these comments were provided to NRC Human Factor Engineering Branch in a meeting in Bethesda, Maryland, on June 14, 1984. The TVA responses are documented in reference 12. As a result of this meeting, revisions were made to SEP 82-17 (Ref. 9b). Reference 6 committed TVA to conduct the SQN CRDR in accordance with the TVA-developed CRDR program plan.

9. The SQN CRDR was initiated in August 1984. As of December 20, 1985, the following major CRDR tasks have been completed.

- Operator questionnaires.
- Operator interviews.
- Operating experience reviews of licensee event reports and scram reports.
- Control room checklist surveys and inventories.
- Sound, lighting and heating, ventilation, and air conditioning (HVAC) control room surveys.
- Task analysis of emergency operating procedures.
- Review of human engineering concerns (HECs) resulting from the Watts Bar Nuclear Plant CRDR effort (partially complete).

Each of these tasks (except for the Watts Bar HEC review) is addressed by NUREG-0700 and detailed in the TVA CRDR program plan.

10. The following is a list of major SQN CRDR tasks yet to be completed. A schedule for completing them is currently being developed.

- Complete review of WBN CRDR generated HECs.
- Assessment of SQN CRDR HECs.
- Development of SQN CRDR team recommended corrective actions for any identified human engineering discrepancies (HEDs).
- Preparation of an action plan to address proposed corrective actions.
- Preparation and submittal of the summary report of the completed CRDR to NRC.

11. As of December 19, 1985, approximately 950 human engineering concerns have been identified during the SQN CRDR. The SQN CRDR HEC assessment will evaluate each concern against identified NRC guidelines to determine their validity. All valid HECs will be redefined as human engineering discrepancies (HEDs) and assigned to one of four categories as follows:

- Category 1 - HED could result in errors which directly challenge or cause a loss of a critical safety function.

- Category 2 - HED could reduce or cause a loss of resources needed to maintain a critical safety function.

- Category 3 - HED could adversely affect normal plant operation or has potential to affect critical safety function resources.

- Category 4 - HED has no significant affect on plant operations.

The proposed resolution of these HEDs along with a proposed schedule for implementing corrective actions must be submitted to NRC in the CRDR Summary Report.

12. The CRDR is not a complete design of the control room nor is it an ongoing control room design change effort. It is intended to identify and resolve human engineering discrepancies with the existing control room layout/environment in light of lessons learned from the TMI incident and subsequent NRC human factors guidelines issued in 1981.

13. Office of Engineering Procedure OEP-11 (Ref. 13) defines the process by which plant design changes, including control room design changes, are identified, scoped, coordinated, reviewed, and approved. This procedure includes the application of human factor engineering principles in these changes and requires the project engineer to coordinate the design and design review effort with appropriate OE organizations. A checklist is provided in the procedure to aid in this process. All future changes to the SQN control room/control boards will be handled by this procedure.

14. The OE Electrical Engineering Branch, Operator Interface Section, has the responsibility to address the application of human factor engineering principles in control room/control board changes. A number of engineering design guides are used in this process. The principle ones are noted below:

a. Design Guide E18.1.11 (Ref. 14)

   This design guide presents principles and techniques of human factors engineering (HFE) pertinent to designing operator work stations in power generating plants.

b. Design Guide E18.1.12 (Ref. 15)

   This guide describes methods and techniques of HFE in control console and cabinet design and panel layout. It provides a means for measuring the HFE adequacy of new designs and of modifications to existing designs.

c. Design Guide E18.1.13 (Ref. 16)

This document defines and documents accepted HFE principles and standards to be employed for the design of annunciators and alarm systems.

d. Design Guide E18.1.14 (Ref. 17)

This design guide details the human factors requirements for controls and displays that are integrated into a functional panel design. Criteria that will help the operator identify and operate the controls and displays quickly and efficiently is presented.

e. Design Guide E18.1.15 (Ref. 18)

This design guide contains general HFE requirememts for operator interface with computers and computer driven devices.

IV. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

1. The first issue raised by the concern of record is not substantiated because the required SQN control room design review is currently in progress.

2. The second issue raised by the concern of record appears to be substantiated because the SQN control room design review has identified a significant number of human engineering concerns (HECs) which are potential discrepancies based on NRC issued guidelines. Although the assessment of these HECs is not complete, it is reasonable to assume that several human engineering discrepancies (HEDs) will be identified for resolution.

B. Recommendations

1. I-85-241-SQN-01, CRDR Followup

Copies of the final SQN CRDR team recommendations and the SQN CRDR summary report of the completed review should be submitted to the NSRS for review. [P3]

DOCUMENTS REVIEWED IN INVESTIGATION I-85-241-SQN
AND REFERENCES

1. Letter from D. G. Eisenhut (NRC) to All Licensees of Operating Plants and Applicants for Operating Licenses and Holders of Construction Permits, "Post TMI Requirements," dated October 31, 1980 (A02 801110 008)

2. NUREG-0737, "Clarification of TMI Action Plan Requirements," October 1980

3. Letter from L. M. Mills to A. Schwencer of the Nuclear Regulatory Commission dated December 19, 1980, detailing the SQN response to Reference 1 (A27 801219 022)

4. Letter from D. G. Eisenhut to All Licensees of Operating Reactors, Applicants for Operating Licenses and Holders of Construction Permits, "Supplement 1 to NUREG-0737 - Requirements for Emergency Response Capability (Generic Letter 82-33)," dated December 17, 1982

5. Supplement 1 to NUREG-0737, "Requirements for Emergency Response Capability," December 1982

6. Letter from L. M. Mills (TVA) to Ms. E. Adensam (NRC) dated April 15, 1983, in response to Generic Letter 82-33 (Ref. 4) (A27 830415 016)

7. Letter to H. G. Parris from E. G. Adensam (NRC), "Issuance of Orders Confirming Licensee Commitments on Emergency Response Capability," dated June 15, 1984 (A02 840620 001)

8. NUREG-0700, "Guidelines for Control Room Design Reviews," published September 1981

9. Special Engineering Procedure SEP 82-17, "Control Room Design Reviews for All TVA Nuclear Plants"

   a. Revision 0 dated April 13, 1983
   b. Revision 1 dated May 2, 1984

10. Letter from D. S. Kammer (TVA) to Ms. E. Adensam (NRC) transmitting the TVA CRDR Program Plan dated June 9, 1983 (A27 830609 001)

11. Letter from T. M. Novak (NRC) to H. G. Parris (TVA), "Comments on TVA Program Plan for Control Room Design Reviews," dated December 23, 1983 (A02 831229 001)

12. Memorandum from M. C. Brickey to Electrical Engineering Files, "Main Control Room Design Review - All Nuclear Plants," dated June 22, 1984 (EEB 840626 927)

13. Office of Engineering Procedure OEP-11, "Change Control," Revision 0, dated April 26, 1985

14. EN DES Design Guide E18.1.11, "Human Factors Engineering in Main Control Room and Local Work Stations," Revision 0, dated May 11, 1982

15. EN DES Design Guide E18.1.12, "Human Factors Engineering in Control Console, Cabinet, and Panel Layout," Revision 0, dated April 30, 1982

16. EN DES Design Guide E18.1.13, "Human Factors Engineering in Alarm Systems," Revision 0, dated July 16, 1982

17. EN DES Design Guide E18.1.14, "Human Factors Engineering in Controls and Visual Displays," Revision 0, dated April 30, 1982

18. EN DES Design Guide E18.1.15, "Human Factors Engineering in Operator/Computer Interface and Dialog," Revision 0, dated May 19, 1982

TVA 64 (OS-9-65) (OP-WP-5-85)

NRC

UNITED STATES GOVERNMENT

Memorandum TENNESSEE VALLEY AUTHORITY

TO: W. T. Cottle, Site Director, Watts Bar Nuclear Plant

FROM: K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

DATE: JAN 29 1986

SUBJECT: NUCLEAR SAFETY REVIEW STAFF INVESTIGATION REPORT TRANSMITTAL

Transmitted herein is NSRS Report No. I-85-161-WBN

Subject UNMARKED BOLTING MATERIAL

Concern No. IN-85-388-003

and associated recommendations for your action/disposition.

It is requested that you respond to this report and the attached recommendations by February 25, 1986. Should you have any questions, please contact R. L. Newby at telephone 3659-WBN.

Recommend Reportability Determination: Yes X No ____

Director, NSRS/Designee

RLN:GDM
Attachment
cc (Attachment):
R. P. Denise, LP6N40A-C
D. R. Nichols, E10A14 C-K
QTC/ERT, Watts Bar Nuclear Plant
E. K. Sliger, LP6N48A-C

--Copy and Return--

To : K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

From: _____

Date: _____

I hereby acknowledge receipt of NSRS Report No. I-85-161-WBN
Subject UNMARKED BOLTING MATERIAL for action/disposition.

_____ _____
Signature Date

0332U

TENNESSEE VALLEY AUTHORITY

NUCLEAR SAFETY REVIEW STAFF

NSRS INVESTIGATION REPORT NO. I-85-161-WBN

EMPLOYEE CONCERN IN-85-388-003

MILESTONE 6

SUBJECT: UNMARKED BOLTING MATERIAL

DATES OF INVESTIGATION: January 9-22, 1986

INVESTIGATOR: R. L. Newby — Date: 1-23-86

REVIEWED BY: P. R. Washer — Date: 1-24-86

APPROVED BY: for M. A. Harrison — Date: 1-24-86

I. BACKGROUND

NSRS has investigated Emplovee Concern IN-85-388-003 which the Quality Technology Company (QTC) identified during the Watts Bar Employee Concern Program. The concern was worded:

> ASTM 307 bolting materials do not have manufacturers stamp. and receiving does not always keep separated in bundles. Units 1 & 2.

II. SCOPE

The scope of this investigation was determined from the stated concern to be that ASTM A307 bolting material does not have the manufacturer's identification marks stamped on the material nor is it kept bundled or tagged to provide traceability to the manufacturer.

Requirements and Commitments

The following upper-tier documents and commitments were reviewed and utilized during this investigation.

A. ASTM A307-84. "Specification for Carbon Steel Externally Threaded Standard Fasteners"

B. TVA General Construction Specification G-53. R4. "ASME Section III and Non-ASME Section III (including AISC. ANSI/ASME B31.1. and ANSI B31.5) Bolting Material"

III. SUMMARY OF FINDINGS

A. Review of the upper-tier requirements revealed that the identification of the manufacturer on the bolting material is a requirement for A307 bolting material.

B. Storage areas in the construction warehouse and subwarehouse were inspected. All A307 bolting material inspected by the investigator had the required vendor identification permanently stamped or marked on the bolt heads. All material inspected was identified either on the storage bins/containers or tags on the material.

C. Interviews with warehouse and material inspection personnel revealed that all A307 bolting material had been reinspected in 1982. This reinspection was prompted by NCR 3372. All bolts without proper identifying marks were removed from warehouse storage and tested by Singleton Materials Engineering Laboratory (SME). All bolting material had acceptable test results and was identified and returned to storage.

D. Review of the background and history of this problem revealed that two NCRs (1602 in 1974 and 3372 in 1981) had been written in the past to document the same problem of unidentified bolting material as identified in this concern. Both NCRs documented that material had been accepted at receiving inspection and apparently issued. No mention is made on the NCRs (or documentation associated with them) as to whether the issued material was tracked down and marked with the manufacturer's ID or markings traceable to the TVA test report.

E. The investigator reviewed the Watts Bar construction procedures to verify that the program required verification of manufacturer ID markings. The procedures reviewed are listed below.

1. WBNP-QCP-1.06. R8. "Receiving Inspection"

2. WBNP-QCP-1.42-1. R6. "Flange Bolting"

3. WBNP-QCP-1.42-2. R4. "Bolt and Gap Inspection for Bolt Anchor Assemblies"

4. WBNP-QCP-1.42-3. R4. "Structural and Miscellaneous Bolted Connections"

5. WBNP-QCP-2.04. R14. "Fabrication. Erection. and Inspection of Structural and Miscellaneous Steel"

6. WBNP-QCP-4.23-8. R7. "Support Final Inspection"

All procedures reviewed. except QCP-4.23-8. required bolting material verification including the manufacturer identification markings. QCP-4.23-8 specifically accepts bolting material with or without the manufacturer's ID markings on A307 bolting material unless otherwise specified by OE-approved documents. Interviews with Hanger QC personnel verified that they accept A307 bolting material without the manufacturer's ID marking.

F. Further investigation revealed that the NRC had identified a similar concern on vendor-supplied equipment during an inspection on May 3, 1985. TVA responded to the NRC (L44 860629 800) with a testing program similar to Construction Specification G-53. The different vendors researched their records and. in conjunction with the TVA test results. determined that the bolting was acceptable and in accordance with the drawings in all but two cases. Both of these cases were documented (one by OE and the other by NUC PR) and properly handled in accordance with site procedures.

G. The investigation revealed that 123 samples of A307 bolting material were sent to SME for documentation of material grade in August of 1985. The material represented by these samples was construction stock (nonpermanent-"01") material which had proper markings but was not procured with Certificates of Compliance. Singleton test report BNRI-850913-1. Parts III and IV. representing these samples was reviewed. All material tested was acceptable. Warehouse personnel stated that this was done to alleviate any concern that uncertified bolting material may be in the plant since this construction material appeared identical to permanent material.

IV. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

A. The portion of this concern dealing with the lack of A307 bolting material manufacturer ID markings is substantiated. This is based on the past NCRs and corrective actions taken in response to them. Both NCRs accepted the bolting material, but no objective evidence is available to determine if they were marked after certification by TVA to indicate the manufacturer or certifying laboratory. Bolting material on supports was and still is accepted without ID markings.

B. The portion of this concern dealing with keeping the bolting material in bundles is not substantiated since no requirement could be found requiring bundling, only that the material be traceable to the point of installation.

Recommendations

I-85-161-WBN-01 - Revise QCP-4.23-8

Revise QCP-4.23-8, Paragraph 7.8.1, to require verification of bolting material with manufacturer's ID stamp.

I-85-161-WBN-02 - Investigate Installed Bolting Material

Investigate bolted connections that were inspected utilizing the acceptance criteria of QCP-4.23-8 to determine if A307 bolting material is installed that lacks traceability back to the manufacturer (either on the material or documents traceable to the material and installation).

I-85-161-WBN-03 - Train QC Personnel

Train all QC inspection personnel who inspect to QCP-4.23-8 acceptance criteria to verify that all bolting material has a manufacturer's ID mark.

TVA 64 (OS-9-65) (OP-WP-5-85)

NRC

UNITED STATES GOVERNMENT

Memorandum TENNESSEE VALLEY AUTHORITY

TO: W. T. Cottle, Site Director, Watts Bar Nuclear Plant

FROM: K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

DATE: JAN 29 1986

SUBJECT: CORRECTIVE ACTION RESPONSE EVALUATION

REPORT NO. : I-85-124-WBN

SUBJECT : 47A050 DRAWING NOTES

CONCERN NO.: IN-85-052-001

( ) ACCEPT (X) REJECT

1. I-85-124-WBN-01 "Justification for Deviations"
NSRS rejects the response to this item for the following reasons. TVA Topical Report TVA-TR-75-1, Table 17D-1 states that TVA conforms fully to Regulatory Guide 1.64, Rev 2, 1976. This Regulatory Guide endorses ANSI N45.2.11-1974. This latter standard requires in section 3.1 that, "changes from specified design inputs including the reasons for the changes shall be identified, approved, documented, and controlled." Thus, NSRS believes that all changes to identified inputs such as Construction Specification G-29C or AWS-D1.1 need to be justified. The response does not indicate this is to be done for all exceptions to these standards which are identified in the report.

2. I-85-124-WBN-02 "Approval of Exceptions"
NSRS rejects the response to this recommendation. The description that implementation of construction specifications was optional was given to NSRS by management level personnel. Therefore NSRS concludes that additional training in this area is warranted.

K. W. Whitt

BFS:JTH
cc (Attachment):
R. P. Denise, LP6N40A-C
D. R. Nichols, E10A14C-K
QTC/ERT, CONST-WBN
E. K. Sliger, LP6N48A-C

Principally prepared by Bruce F. Siefken.

319U

TVA 64 (05-9-65)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

TO : K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

FROM : W. T. Cottle, Site Director, Watts Bar Nuclear Plant P&E (Nuclear)

DATE : JAN 13 1986

SUBJECT: WATTS BAR NUCLEAR PLANT - RESPONSE TO EMPLOYEE CONCERN INVESTIGATION REPORT I-85-124-WBN (EMPLOYEE CONCERN NUMBER IN-85-052-001)

Reference: Memorandum from R. M. Pierce to K. W. Whitt dated July 19, 1985

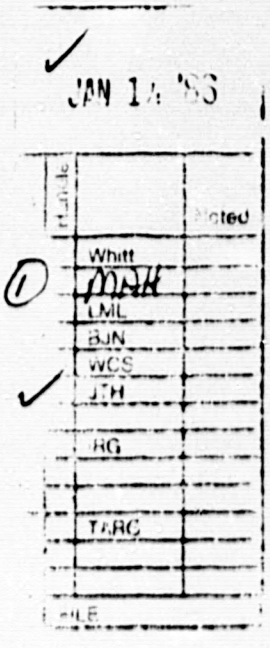
The referenced memorandum provided the initial response to the recommendations contained in the subject investigation report which was subsequently rejected. Attached is a revised response which has been previously provided to Bruce Siefken of your staff on an informal basis.

If you have any questions, please contact W. L. Byrd at 3774, Watts Bar Nuclear Plant P&E (Nuclear).

W. L. Byrd for
W. T. Cottle

WLB:SRS:NC
cc (Attachment):
J. C. Standifer, Watts Bar Engineering Project, P-104 SB-K

This memorandum was principally prepared by S. R. Stout.



WATTS BAR NUCLEAR PLANT
REVISED RESPONSE TO NSRS INVESTIGATION REPORT I-85-124-WBN
EMPLOYEE CONCERN IN-85-052-001

Recommendation I-85-124-WBN-01 -- Justification for Deviations

Revised Response

Deviations from standards and construction specifications for the 47A050 notes are controlled and adequately reviewed and approved by issuance of the design drawings in accordance to Office of Engineering (OE) procedures and by engineering calculations, if deemed necessary. Calculations are accessible in the RIMS system under calculation identifier 47A050 or 47A0501J (sample attached). These calculations specifically state the basis for deviation.

As is the case in any specification that is generic, all requirements or situations encountered during the construction of a large project cannot always be included in generic specifications. Rather than revise the generic construction specifications to cover every situation that may be encountered for a specific project, OE typically provides supplemental information by revisions to applicable design drawings. In all cases where design drawings and construction specifications do not agree, the design drawing takes precedence. Issuance of the design drawing is controlled by the OE procedures which assures that any exceptions are adequately reviewed and approved before issue.

Recommendation I-85-124-WBN-02 - Approval of Exceptions

Revised Response

Construction specifications are issued by OE to give instructions to the installer for minimum installation requirements to ensure that the final constructed product is adequate. These specifications are generic to all construction projects, both nuclear and non-nuclear. Construction specifications are considered the upper tier document used by Construction (OC) in the development of Quality Control (QC) procedures that govern the actual installation and inspection processes and are defined as such in the present Construction Requirements Manual N3G-101 for Watts Bar. The implementation of construction specifications is not optional for either OE or OC.

TVA 10697 (OE-4-85)

OE CALCULATIONS

TITLE SYSTEM: N/A CALCULATIONS FOR PIPE SUPPORT GENERAL CALC. # 19	PLANT/UNIT WATTS BAR NUCLEAR/ 1 & 2
PREPARING ORGANIZATION WBEP PASG SD- 2	KEY NOUNS (Consult RIMS DESCRIPTORS LIST) SUPPORT, HANGER, 47A050, NOTE 50

BRANCH/PROJECT IDENTIFIERS	Rev	(for RIMS' use)	RIMS accession number
1) WMG3114 2) 47A050 3) 47A0501J	R0		B41 '85 0809 904
APPLICABLE DESIGN DOCUMENT(S) 1) WBN PSDM 2) WB-DC-40-31.9 or 31.15	R _		
	R _		
SAR SECTION(S) 3.9 / UNID SYSTEM(S) NA	R _		

Each time these calculations are issued, preparers must ensure that the original (RO) RIMS accession number is filled in.

	Revision 0	R1	R2	R3
ECN No. (Indicate if Not Applicable)	~~# 5813~~ N/A			
Prepared	Terry E. Lantz			
Checked	R. Houston Bonelli			
Reviewed	Hal B Thomas			
Approved	T T Clancello			
Date	8/12/85			
List all pages added by this revision.				
List all pages deleted of this revision.				
List all pages changed by this revision.				

Use form TVA 10534 if more room required.

Statement of Problem

DOCUMENT DESIGN CALCULATIONS FOR N/A SYSTEM PIPE SUPPORT GENERAL CALC # 19 FOR 47A050 NOTE 50.

Abstract

R 0 CALCULATION

CALCULATIONS SHOW THAT R * OF THE SUBJECT ~~SUPPORT~~ NOTE 50 MEETS ALL APPROPRIATE CRITERIA.

* 47A050-1J R1 THRU R6 & IN R6 THRU R8

cc: RIMS, SL26 C-K

TVA

REVISION LOG

Title: CALC FOR PIPE SUPPORT GENERAL CALC #19

WMG3114

Revision No.	DESCRIPTION OF REVISION	Date Approved

SUPPORT CALCULATIONS SUMMARY

SUPPORT MK. NO. N/A PROJECT WATTS BAR N.P UNIT 1 & 2

SUPPORT DRAWING(S) GENERAL CALC #19

CALCULATIONS BY TERRY E. LANTZ DATE 8-8-85 CHECKED BY RHB DATE 8-9-85

ANALYSIS REFERENCE N/A

☐ ALTERNATE CRITERIA
☐ SNP ☐ WBNP

☐ RIGOROUS ANALYSIS
PROB NO. _____
JT. NO. _____ DIR _____ TYPE _____
ISO NO. _____ REV _____
LOAD TABLE _____ REV _____

SUPPORT SHOWN ON

DRAWING _____
☐ PIPING DWG ☐ EDS ISO ☐ OTHER _____

REASON FOR REVISION

ECN _____ FCR _____ NCR _____
DCR _____ OTHER _____

CALCULATION STATUS

A. ☐ CALCULATIONS NOT REQUIRED BECAUSE OF:
☐ REDUCED LOAD ☐ MINOR LOCATION CHANGE
☐ PART NO. CHANGE ☐ SEE REMARKS

B. ☐ REFER TO CALCULATIONS FOR SUPPORT MK. NO. _____ REV ____ (SEE REMARKS)
MEDS ACCESSION NO. _____

C. ☒ CALCULATIONS ATTACHED

DESIGN INFORMATION N/A

A. DESIGN LOADS
☐ LOCAL ☐ GLOBAL ☐ NORMALIZED
F(x) _____ F(y) _____ F(z) _____

B. DESIGN MOVEMENTS
Δx _____ Δy _____ Δz _____

C. MAXIMUM MOVEMENTS
Δx _____ Δy _____ Δz _____

DESIGN SUMMARY

	CALCULATED	ALLOWABLE
A. MAXIMUM STATIC DEFLECTION		
B. MAXIMUM DESIGN DEFLECTION		
C. MAXIMUM MEMBER STRESS		
D. MAXIMUM WELD STRESS		
E. MAXIMUM BOLT LOAD		
F. OTHER		

DESCRIPTION OF CHANGE JUSTIFICATION OF 47A050 HANGER NOTE 50.

REMARKS THE SUBJECT NOTE IS FULLY ADEQUATE.

PIPE SUPPORT CALCULATION SHEET

WATTS BAR N.P. Project

Sheet 2 of 2 | WMG 3114

Calc. I.D. GENERAL CALCS #19

Prepared by T.E. LANTZ Date 8-9-85

Checked by R#B Date 8-9-85

REFERENCES

SUBJECT:

PURPOSE : JUSTIFICATION OF 47A050 SERIES, NOTE 50.

NOTE # 50 IS THE WELDING TOLERANCE EITHER IN THE SIZE OF FILLET OR IN THE WELD LENGTH. THE WELD SIZES AND LENGTHS ON THE DESIGN DRAWINGS ARE MINIMUM WELD SIZES AND ARE IN ACCORDANCE WITH THE "AISC SPECIFICATIONS FOR THE DESIGN, FABRICATION, AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS." NOTE #50 IS NOT IN CONFLICT WITH AWS D1.1 OR THE AISC SPECIFICATIONS, BUT IS A CASE-BY-CASE TOLERANCE DEVIATING FROM GENERAL CONSTRUCTION SPEC G 29-C, 3.C.5.2 (R2), SECTION 4.9 SINCE IT ALLOWS FOR A WELD TO BE GREATER THAN 3/16" LARGER THAN SPECIFIED. THIS IS ACCEPTABLE DUE TO THIS UNIQUE SITUATION WHERE WELD AND STEEL STRESSES FOR PIPE/CONDUIT/TUBING SUPPORTS ARE GENERALLY LOW SINCE THE LIMITING FACTOR ON SUPPORT DESIGN IS USUALLY THE DEFLECTION REQUIREMENTS TO ASSURE SUPPORT RIGIDITY OR THE REQUIREMENT FOR A SAFETY FACTOR OF FIVE ON EXPANSION ANCHORS. THIS GENERALLY RESULTS IN A VERY LARGE FACTOR OF SAFETY IN THE WELDS AND STEEL. WHEN THE WELD IS ALLOWED TO BE INCREASED (UP TO 100%) IT WILL RESULT IN AN INCREASED FACTOR OF SAFETY, AND THEREFORE WILL NOT COMPROMISE THE STRUCTURAL ADEQUACY OF THE SUPPORT.

CONCLUSION :

47A050 (NOTE 50) IS FULLY ADEQUATE.

CORRECTIVE ACTION RESPONSE EVALUATION

REPORT NO: I-85-124-WBN

SUBJECT: 47A050 Drawing Notes

CONCERN NO: IN-85-052-001

☐ ACCEPT

☐ ACCEPT WITH COMMENT ☒ REJECT

I-85-124-WBN-01, Justifications for Deviations

NSRS finds that your response to this item is not adequate. NSRS does not agree that the issuance of the 47A050 drawings constitutes justifications for deviating from approved construction specifications. Our objection is based on the following points:

a) The basis for the deviation is not documented on the drawing.

b) There is no means of tracing the design calculation from either the drawings or the construction specification.

NSRS again recommends that deviations from AWS D1.1 and G-29C be explicitly established. This item remains open.

I-85-124-WBN-02, Approval of Exceptions

NSRS finds that your response to this item is not acceptable. The implementation of construction specifications was described as being optional by OE personnel. This is not an acceptable design philosophy unless exceptions are justified. This problem effects more than just the 47A050 notes. This item remains open.

for B F Sheppard
Prepared By

7/26/85
Reviewed By

REPROKW:J

Report No : I-85-124-WBN
Subject : 47A050 Drawing Notes
Concern No: IN-85-052-001

Finding

I-85-124-WBN-01, Justification for Deviations

Conclusion

No written justification for deviating from AWS D1.1 was found. Furthermore, the 47A050 notes could violate G-29C, but no written justification was found. Since the 47A050 notes apply to a large number of hangers, a written justification for violating G-29 requirements is warranted.

Recommendation

A written justification for taking exception to AWS D1.1 and G-29 needs to be established for the 47A050 notes. Exceptions to other construction specifications also need to be justified.

Response

Engineering calculations are performed to justify any exceptions to AWS D1.1 and/or G-29. These calculations and the 47A050 note issue include interface review with the appropriate design organizations per OE procedures. The General Construction Specification is generic to all projects and the 47A050 notes which are tolerance notes provide clarification and approved exceptions to the specification. It has always been, and will continue to be, OE policy that requirements as stated on design drawings take precedence over construction specifications and this is so stated in this series of notes. The written justification would be issuance of the design drawing which is reviewed and controlled by the OE procedures.

Finding

I-85-124-WBN-02, Approval of Exceptions

Conclusion

Exceptions to construction specification G-29 are not required to be justified or approved by the originators of the construction specification.

Recommendation

Exceptions to construction specifications need to be justified in writing and approved by the originator of the specification. This exception should then become a part of the specification. A similiar procedure is currently used for design criteria.

Response

Exceptions to construction specifications in the form of additional or revised notes to the 47A050 notes are approved in accordance to OE procedures. These exceptions are approved by the originator of the construction specification by review prior to issue and by approval of the issued drawings.

EMPLOYEE CONCERN DISPOSITION REPORT

CONCERN NO. HI-85-029-001

DATE OF PREPARATION: 1-15-86

CONCERN: TVA routinely takes adverse job actions, including termination, against employees who express nuclear or personnel safety concern.

INVESTIGATION PERFORMED BY: ERT/OGC

FINDING(S): Although the concern was general, the investigation centered around one specific alleged dangerous activity since this was the only management action that the concerned individual was able to relate. The concerned individual said he was told to clean up a hydrazine spill which occurred some 18-20 months ago and that he refused to do it without proper protection.

He acknowledges that he received no adverse action for his refusal to clean up the spill without proper protective clothing and that he knew of no disciplinary action taken against or harassment of anyone involved in the spill. There is no evidence that anyone was disciplined for involvement in this matter.

CORRECTIVE ACTION(S): None required

CLOSURE STATEMENT: This concern was not substantiated for the specific incident stated. The generic concern is being investigated by ERT and the results will be sent upon completion.

EMPLOYEE CONCERN DISPOSITION REPORT

CONCERN NO. HI-85-041-001

DATE OF PREPARATION: 1-15-86

CONCERN: People are given two weeks off for reporting inadvertent quality violations. This discourages reporting any future problems.

INVESTIGATION PERFORMED BY: ERT/OGC

FINDING(S): The concerned individual (CI) stated that in the ten years he has been at Watts Bar, he does not know of any specific incident in which an individual received adverse action for reporting an inadvertent quality violation. There was no evidence that the CI or any other employee has suffered any adverse action for reporting instances involving inadvertently damaged work.

CORRECTIVE ACTION(S): None required

CLOSURE STATEMENT: This concern was not substantiated. The generic concern is being investigated by ERT and the results will be sent upon completion.

EMPLOYEE CONCERN DISPOSITION REPORT

CONCERN NO. HI-85-067-001

DATE OF PREPARATION: 1-15-86

CONCERN: CI expressed that employees are afraid to report any damage for fear of reprisal. TVA is more interested in punishing someone rather than identifying and correcting a nonconformance. No specifics known.

INVESTIGATION PERFORMED BY: ERT/OGC

FINDING(S): The concerned individual stated that the feeling among employees is that if an employee sees something wrong the thing to do is keep quiet about it. The employee could not identify any particular incidents where this occurred and provided no details in support of the allegation. There is no evidence that this employee had been involved in any protected activity for which he received some adverse action.

CORRECTIVE ACTION(S): None required

CLOSURE STATEMENT: This concern was not substantiated. The concerned individual did not identify any reported incidents of damage and no employees were identified as receiving adverse action for reporting damage. The generic concern is being investigated by ERT and the results will be sent upon completion.

CONCERN NO. HI-85-020-001

DATE OF PREPARATION: 1-15-86

CONCERN: Individuals receive disciplinary action for voluntary reporting accidental damage to equipment or inadvertent violation of procedure, which creates an atmosphere in which discrepancies and inadvertent violations are not reported due to reprisals.

INVESTIGATION PERFORMED BY: ERT/OGC

FINDING(S): During subsequent contact with the concerned individual, it was learned that the general concern was based upon an incident which involved an employee who accidentally damaged a cable while drilling into a cable tray. Investigation of the incident revealed the following information:

On January 31, 1979, an employee drilled through a cable tray and damaged the cable jacket. He reported this incident to his supervisor.

On January 31, 1979 the employee received a warning letter for failing to exercise the necessary caution when drilling through cable trays containing cable. In his statement to QTC he recognized his carelessness when doing this drilling. In this instance, TVA had a legitimate basis for communicating to its employee that TVA cannot ignore careless work on safety systems.

The electrical superintendent at the time this incident occurred stated that employees were encouraged to report QA violations and that employees were not disciplined for doing so. He said the employee did receive a warning letter for his negligence in drilling into the cable.

The employee was terminated for two violations within six months of the daily work schedule on construction projects. The employee told QTC that he could not attribute the incident when he drilled into the cable to his termination.

The employee filed a grievance on his termination, and the arbitrator found that the record supported that he violated Supplementary Schedule H-XIX of the negotiated General Agreement between the Tennessee Valley Authority and the Tennessee Valley Trades and Labor Council and that the grievance could not be sustained.

CORRECTIVE ACTION(S): None required

CLOSURE STATEMENT: This concern was not substantiated for this specific incident. The generic concern is being investigated by ERT and the results will be sent upon completion.

PSR

EMPLOYEE CONCERN ASSIGNMENT REQUEST

To: Director - NSRS TRANSMITTAL NUMBER - T50-229

ERT has received the Employee Concern identified below, and has assigned the indicated category and priority:

Priority: 1 Concern #: BEP-5-001-001
I-86-161-BLN

Category: 88 Confidentiality: N/A YES N/A NO (1 & H)

Supervisor Notified: XX YES NO Nuclear Safety Related -YES

Concern: On several occasions, an inspector did not perform required inspections, but signed quality documents acceptable as if the inspection function was properly performed. The supervisor was fully aware of this situation. Details known to QTC and withheld to maintain confidentiality. No further information may be released. Construction dept. concern. CI has no further information.

No follow up required. BLN/Required inspection

William S. [signature]
MANAGER, ERT DATE

NSRS has assigned responsibility for investigation of the above concern to:

ERT ✓ BS

NSRS/ERT ________

NSRS ✓ RCS

OTHERS (SPECIFY) OGC - falsification

Inspection
Inspectors

[signature] 1-24-86
NSRS DATE

PSR

EMPLOYEE CONCERN ASSIGNMENT REQUEST

To: Director - NSRS TRANSMITTAL NUMBER - TSO-229

ERT has received the Employee Concern identified below, and has assigned the indicated category and priority:

Priority: 1 Concern #: BEP-5-001-003
I-86-162-PNS

Category: 88 Confidentiality: N/A YES N/A NO (I & H)

Supervisor Notified: XX YES NO Nuclear Safety Related -YES

Concern: Inspection records have been forged/falsified. Details known to QTC and withheld to maintain confidentiality. No further information may be released. Construction dept. concern. CI has no further information.

No follow up required.

B&R/Inspection Records

William A. Hehl
MANAGER, ERT DATE

NSRS has assigned responsibility for investigation of the above concern to:

ERT ✓ PNS

NSRS/ERT_____

NSRS ✓ RCS

(OTHERS) (SPECIFY) OGC

Bruce F. Sieglen 1-24-86
NSRS DATE

AV PSR

EMPLOYEE CONCERN ASSIGNMENT REQUEST

TO: Director - NSRS TRANSMITTAL NUMBER T50256

ERT has received the Employee concern identified below, and has assigned the indicated category and priority:

Priority: 3 Concern #EX-85-057-002

Category: 86 Confidentiality: ___Yes ___No(I&H)

Supervisor Notified: ___Yes X___No Nuclear Safety Related ___~~NO~~ FCS PSR

Concern: SECURITY IS NOT AS THOROUGH AS IT SHOULD BE IN PLACES. A PERSON CAN SLIP FROM UNIT 2 TO UNIT 1 IF THEY WANT TO. CONSTRUCTION DEPARTMENT CONCERN. NO FURTHER INFORMATION IN THE FILE.

NO FOLLOW-UP REQUIRED.

William A. Walsh JAN 22 1986
Manager, ERT Date

NSRS has assigned responsibility for investigation of the above concern to:

ERT_____

NSRS/ERT_____

NSRS ✓ WDS

OTHERS (SPECIFY)_____

Security Branch

Bruce L. Bayless 1-24-86
NSRS Date

PSF

EMPLOYEE CONCERN ASSIGNMENT REQUEST

TO: Director - NSRS TRANSMITTAL NUMBER T50245

ERT has received the Employee concern identified below, and has assigned the indicated category and priority:

Priority: 1 Concern #EX-85-093-001

Category: 7 Confidentiality:___Yes____No(I&H)

Supervisor Notified:____Yes____No Nuclear Safety Related_YES_

Concern: CI FEELS THAT WELDING INSPECTORS SHOULD BE QUALIFIED WELDERS, INSTEAD OF COLLEGE KIDS THAT DON'T KNOW ANYTHING ABOUT WELDING. CI DECLINED TO PROVIDE INFORMATION. NO ADDITIONAL INFORMATION IS AVAILABLE IN THE FILE.

welding Inspectors

JAN 17 1986

Manager, ERT Date

NSRS has assigned responsibility for investigation of the above concern to:

ERT ___/___

NSRS/ERT _____

NSRS _____

OTHERS (SPECIFY) _____

welding Inspectors

NSRS 1-24-86 Date

PSR

EMPLOYEE CONCERN ASSIGNMENT REQUEST

TO: Director - NSRS TRANSMITTAL NUMBER T50251

ERT has received the Employee concern identified below, and has assigned the indicated category and priority:

Priority: 1 Concern #IN-85-008-004
I-86-163-GBN

Category: 52 Confidentiality:___Yes____No(I&H)

Supervisor Notified:____Yes_X__No Nuclear Safety Related_YES_

Concern: UNIT 2. REACTOR BUILDING, ELEV. 751', AZ. 300 DEGREES, JUNCTION BOX 27 MAY HAVE AN IMPROPERLY INSTALLED CONDUIT. DETAILS KNOWN TO QTC, WITHHELD DUE TO CONFIDENTIALITY. NO FURTHER INFORMATION MAY BE RELEASED. CONSTRUCTION DEPARTMENT CONCERN. CI HAS NO FURTHER INFORMATION.

imp metal conduit

O B Thero 1/20/86
Manager. ERT Date

NSRS has assigned responsibility for investigation of the above concern to:

ERT ~~X~~ BBS Previously assigned as IU-85-008-001 O B Thero 1/20/86

NSRS/ERT_____

NSRS / JDS

OTHERS (SPECIFY)_____

electrical conduit

Bruce L. Hopkins 1-24-86
NSRS Date

PSTC

EMPLOYEE CONCERN ASSIGNMENT REQUEST

TO: Director - NSRS TRANSMITTAL NUMBER T50258

ERT has received the Employee concern identified below, and has assigned the indicated category and priority:

Priority: 1 Concern #IN-85-181-002

Category: 53 Confidentiality: ___Yes____No(I&H)

Supervisor Notified: _X__Yes____No Nuclear Safety Related_YES_

Concern: THE FIRE BARRIER PUT ON THE CABLE TRAYS IS REQUIRED TO HAVE NO MORE THAN 1/8" GAP BETWEEN THE PIECES; HOWEVER, NUMEROUS INSTANCES HAVE BEEN DISCOVERED WHERE THE GAP WAS UP TO 1/2". CONSTRUCTION DEPARTMENT CONCERN. CI HAS NO FURTHER INFORMATION.

William A. Crockett JAN 24 1986

Manager, ERT Date

NSRS has assigned responsibility for investigation of the above concern to:

ERT_____

NSRS/ERT_____

NSRS___✓___WDS

OTHERS (SPECIFY)_____

electrical Trays

Bruce L. Siegler 1-28-86

NSRS Date

PSE

EMPLOYEE CONCERN ASSIGNMENT REQUEST

TO: Director - NSRS TRANSMITTAL NUMBER TS0258

ERT has received the Employee concern identified below, and has assigned the indicated category and priority:

Priority: 1 Concern #IN-85-245-006

Category: 53 Confidentiality: ___Yes____No(I&H)

Supervisor Notified: __X_Yes____No Nuclear Safety Related_YES_

Concern: TVA FAILS TO INCORPORATE CHANGES INTO DESIGNS, EVEN WHEN THE CHANGE WAS PROVEN NECESSARY IN A SEPARATE, BUT SIMILAR HARDWARE CONFIGURATION. THIS RESULTS IN HARDWARE BEING INSTALLED TO OBSOLETE DESIGNS. AND THE HARDWARE THEN MUST BE CUT OUT AND REWORKED TO THE WAY IT SHOULD HAVE BEEN IN THE FIRST PLACE. CI HAD NO FURTHER INFORMATION. (CONSTRUCTION DEPARTMENT CONCERN.)

Wilkinson JAN 24 1986

Manager, ERT Date

NSRS has assigned responsibility for investigation of the above concern to:

ERT_____

NSRS/ERT_____

NSRS____✓____x1

OTHERS (SPECIFY)_____

Design Control

Bruce L. Griffin 1-29-86

NSRS Date