

January 25, 1988

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Docket Nos. 50-259/260/296

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Mr. S. A. White
Manager of Nuclear Power
Tennessee Valley Authority
6N 38A Lookout Place
Chattanooga, Tennessee 37402-2801

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Dear Mr. White:

SUBJECT: DETAILED CONTROL ROOM DESIGN REVIEW (TAC 56104/56105/56106)

Re: Browns Ferry Nuclear Plant, Units 1, 2 and 3

By letter dated December 30, 1986, TVA submitted to the NRC, pursuant to the requirements of NUREG-0737, Item I.D.1 as amended by Supplement 1 to the NUREG, a summary report of the Browns Ferry Nuclear Plant Detailed Control Room Design Review (DCRDR). The NRC's consultant, Science Applications International Corporation (SAIC) has reviewed the summary report and prepared a report which contains a preliminary evaluation and request for additional information. The staff is currently reviewing the report. The staff and our contractor will visit the site February 22 through February 26, 1988 to discuss the report and audit the control room. To aid TVA in preparing for the site visit, and expedite the staff review, we are enclosing a copy of the contractor's report to allow TVA to review the contractor's concerns, open items and be prepared to discuss this report during the staff's site visit. The conclusions reached in the contractor's report may not be the same conclusions which the staff reaches the final safety evaluation report on DCRDR. The staff is providing the contractor's report for information purposes only.

Any questions concerning the site visit or contractor's report, please contact Gerry Gears of my staff at 301-492-0767.

Sincerely,


Original signed by:
Gary G. Zech, Assistant Director
for Projects
TVA Projects Division
Office of Special Projects

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PDR ADOCK 05000259
P PDR

Enclosure:
As stated

cc w/enclosure:
See next page

See previous page for concurrence*

OSP:TVA/LA * OSP:TVA/PM * OSP:AD/TP *  TVA:AD/P
CJamerson GGears:pw BDLiaw GZech

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GGears
1/15/88

OSP:AD/TP
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1/12/88

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INFORMAL TECHNICAL COMMUNICATION

Date September 14, 1987

TO: C. Goodman

FROM: R. T. Liner, Jr. *RTL*

U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Science Applications International
Corporation
1710 Goodridge Drive
McLean, VA 22102

Reference: SAIC Project 1-263-03-020-XX
NRC Contract NRC-03-82-096
NRC TAC No. 50254, 50260, 50296
SAIC Task 19, 1-263-07-557

Title: Detailed Control Room Design Review (DCRDR) Evaluations, Phases III-V

Subject: Preliminary Evaluation of the DCRDR Summary Report for Brown's Ferry Nuclear Plant, Units 1, 2, and 3; TAC Nos. 50259, 50260, and 50296

The Tennessee Valley Authority (TVA) submitted a letter to the NRC dated December 30, 1986 with an attached DCRDR Summary Report for the Browns Ferry Nuclear Plant, Units 1, 2, and 3 (Reference 1). Based on a preliminary evaluation, it is the review team's judgment that TVA meets six of the nine requirements of Supplement 1 to NUREG-0737 (Reference 2).

The following is a preliminary evaluation of the nine Supplement 1 to NUREG-0737 DCRDR requirements for the Browns Ferry Nuclear Plant (BFNP), Units 1, 2, and 3 DCRDRs.

1. Establishment of a Qualified Multidisciplinary Review Team

It is the review team's judgment that the Tennessee Valley Authority (TVA) does meet the Supplement 1 to NUREG-0737 requirement for establishment of a qualified multidisciplinary review team.

2. Use of System Function and Task Analysis (SFTA) to Identify Information and Control Requirements During Emergency Operations

The Task Analysis activities conducted at BFNP were based on the Emergency Operating Instructions (EOIs), developed from the Boiling Water Reactor Owners' Group (BWROG) guidelines.

NRC cc: A. Marinos
S. West

SAIC cc: R. Liner
M. Jordan
Contracts

Task File: 1-263-07-557-05/06/07

A task analysis and walkthrough of the EOIs (EOIs 1 and 2; Rev. 0; 4/3/85; Units 1, 2, and 3) were performed. Subsequent to the completion of this task analysis the EOIs were revised. An update of the task analysis results and a walkthrough were performed based on the revised EOIs (EOIs 1 and 2, Revision 0). The Summary Report states the revised EOIs were approved 6/5/86 and 6/6/86, respectively, but gives no indication of the identity of the approving authority nor any indication of the kinds of emergency tasks for which the EOIs were developed to mitigate or correct.

The Summary Report does not indicate that the BWROG emergency procedure guidelines (EPG) Rev 3 were used as a basis for developing the EOIs from which the individual operators' tasks and their specific instrumentation and control requirements would subsequently be defined. NRC position on the use of EPG Rev 3 is documented in Reference 3.

Section 2.2.2.1 indicates instrumentation and control (I&C) requirements for each identified task was established independent of the control room, however, later in the text the described procedure (and the steps shown in Figure 3, pp. 20 of the Summary Report) indicates development of the EOIs and I&C requirements was not done completely independent of the Control Room.

It is the review team's judgment that TVA does not meet the Supplement 1 to NUREG-0737 requirement for a system function and task analysis to identify control room operator tasks and information and control requirements during emergency operations.

3. Comparison of Display and Control Requirements with Control Room Inventory

It is the review team's judgment that TVA does not meet the Supplement 1 to NUREG-0737 requirement for a comparison of display and control requirements with a control room inventory.

4. Control Room Survey

It is the review team's judgment that TVA does meet the Supplement 1 to NUREG-0737 requirement for a control room survey to identify deviations from human factors principles.

5. Assessment of Human Engineering Discrepancies (HEDs)

It is the review team's judgment that TVA does meet the Supplement 1 to NUREG-0737 requirement for the assessment of HEDs to determine which are significant and should be corrected.

6. Selection of Design Improvements

The selection of design improvements is not complete, for example: Category 1 HEDs 0108, 0148, 0160, 0213, 0214 and 0218 resolutions are dependent on the development of a pending BFNP labeling guideline development; HED 0209 will not be resolved until a, yet to be conducted, lighting survey is completed; HEDs 0159 and 0190 will not be resolved until evaluation of their respective discrepancies has been conducted; HED 0151 will remain unresolved until a plant key control program has been developed; HED 0182 resolution is auditing the establishment of a convention for the assignment of color pens.

Category 2 HED 0113 will not be resolved until the completion of an annunciator study and HED 0199, regarding EOI-related Torus level instrument concerns, resolution is dependent on a, yet to be performed, evaluation program. Proposed corrections for Category 3 and 4 HEDs were not included in the Summary Report but the statement was made that the proposed corrections for Category 3 HEDs had been approved. The text also mentioned that some Category 4 HEDs would be corrected as a result of the resolutions of certain Category 1, 2, and 3 HEDs.

The Summary Report states that the correction schedule calls for implementation of Category 1 HED corrections to be completed by the end of the second refueling outage and implementation of resolutions of Category 2 HEDs is to be completed by the end of the third refueling outage.

It is the review team's judgment that TVA does not meet the Supplement 1 to NUREG-0737 requirement for the selection of design improvements.

7. Verification that Selected Improvements Will Provide the Necessary Correction

It is the review team's judgment that TVA meets the Supplement 1 to NUREG-0737 requirement for verification that selected improvements will provide the necessary corrections.

8. Verification that the selected improvements will not introduce new HEDs into the control room

It is the review team's judgment that TVA does meet the Supplement 1 to NUREG-0737 requirement for verification that selected improvements will not introduce new HEDs into the control room.

9. Coordination of control room improvements with changes from other programs such as safety parameter display system (SPDS), operator training, Reg. Guide 1.97 instrumentation, and upgraded emergency operating procedures

It is the review team's judgment that TVA does meet the Supplement 1 to NUREG-0737 requirement for coordination of the DCRDR with other control room improvement programs.

CONCLUSIONS

In view of the fact that it is the review team's judgment that the licensee does not meet the Supplement 1 to NUREG-0737 requirements for "Use of System Function and Task Analysis (SFTA) to Identify Information and Control Requirements During Emergency Operations," "Comparison of Display and Control Requirements with a Control Room Inventory" and "Selection of Design Improvements" it is recommended that these concerns be resolved during a pre-implementation audit by the NRC. A tentative audit agenda is provided as Attachment 1 to this report.



REFERENCES

1. Browns Ferry Nuclear Plant, Detailed Control Room Design Review Summary Report, Tennessee Valley Authority, December 30, 1986.
2. Supplement 1 to NUREG-0737, "Requirements for Emergency Response Capability" (Generic Letter NO. 82-33) December 17, 1981.
3. Memo for V.A. Moore, NRC from S.H. Weiss, NRC. Subject: "Meeting Summary - Task Analysis Requirements of Supplement 1 to NUREG-0737, May 4, 1984, Meeting with BWR Owners' Group Emergency Procedure Guidelines and Control Room Design Review Committees," May 14, 1984.

TENTATIVE AGENDA
FOR
BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2, AND 3
DETAILED CONTROL ROOM DESIGN REVIEW (DCRDR)
PRE-IMPLEMENTATION AUDIT

DAY 1

- 8:30 AM Introduction and Briefing (NRC).
- 9:00 AM Overview discussion of DCRDR activities and results (Licensee).
- 10:30 AM Brief tour of control room.
- 11:00 AM Requirement 1 - Establishment of a qualified multidisciplinary review team.
- * Review of team management.
 - * Review of team members.
 - * Review of team member's (particularly operations and human factors) roles in each DCRDR activity.
- 12:00 Lunch
- 1:00 PM Requirement 2 - System function and task analysis.
- * Review of upgraded EOPs used for the task analysis (Rev. 3 of the General Electric Emergency Procedure Guidelines).
 - * Determine if a comprehensive task analysis of all operator performed during emergency operations. This includes all Warning, Caution and Note tasks that are to be performed by the operators.

- * Audit a sample set of task analysis documentation. The audit team will evaluate the complete set of documentation for procedure for "Reactor Trip."

3:00 PM Requirement 3 - Comparison of display and control requirements with a control room inventory.

- * Determine if a comprehensive inventory of all control room instrumentation was conducted.
- * Review the results of the verification of the availability of controls and displays to meet the operator's information and control needs.
- * Review the results of the verification of the suitability of controls and displays to meet the operator's information and control needs.

5:00 PM End of review activities/NRC caucus.

DAY 2

8:30 AM Requirement 4 - Control room survey

- * Review of the survey checklists to verify that they conform to guidance such as NUREG-0700.
- * Review of the survey results.

10:00 AM Sample survey conducted in the control room (1 to 2 hrs.).

- * Comparison of sample survey conducted by NRC auditors to licensee's results.

12:00 Lunch

1:00 PM Requirement 5 - Assessment of human engineering discrepancies (HEDs) to determine which are significant and should be corrected.

*Review the assessment process.

*Evaluate how consistently the assessment process was applied to category 1 and 2, safety significant HEDs.

*Determine how the cumulative effects of HEDs was identified and assessed.

3:00 PM Requirement 6 - Selection of design improvements.

*Review the selection of design improvement process.

*Evaluate proposed control room design modifications.

*Evaluate proposed enhancement modifications.

*Evaluate proposed training modifications used to correct HEDs.

*Evaluate proposed training modifications used to correct HEDS.

5:00 PM Break/NRC caucus.

DAY 3 -

8:30 AM Requirement 6 (continued) - Review the selection of design improvements for all safety significant HEDs. †

*65 Category 1 HEDs.

*40 Category 2 HEDs.

11:30 AM Evaluate the implementation schedules for control room modifications.

12:00 Lunch

1:00 PM Requirement 7 - Verification that selected design improvements correct HEDs.

*Review and assess the licensee's process for verifying that the proposed modifications correct the HEDs.

1:15 PM Requirement 8 - Verification that the selected design improvements do not introduce new HEDs.

- * Review and assess the licensee's process for verifying that the proposed modifications do not introduce new HEDs.

1:30 PM Requirement 9 - Coordination of DCRDR with other Supplement 1 to NUREG-0737 initiatives.

- * Review coordination with upgraded EOPs.
- * Review coordination with SPDS.
- * Review coordination with operator training.
- * Review coordination with Reg. Guide 1.97 requirements.

2:00 PM Break/NRC caucus.

2:15 PM Operator interviews

Operator interviews are conducted to determine how well the control room design review addressed the operator needs and concerns. Interviews last from 30 minutes to 45 minutes.

1. Interview a shift supervisor
2. Interview a senior reactor operator
3. Interview a shift technical advisor

4:00 NRC Caucus

- * Determine final conclusions regarding the nine Supplement 1 to NUREG-0737 Requirements.
- * Determine the final conclusions regarding the operators' concerns.
- * Determine the final conclusions regarding the allegations.



4:30 PM NRC audit team/TVA DCRDR team technical discussion.

- * Resolve open issues.
- * Verify that TVA personnel are aware of all technical concerns and what it will take to resolve those concerns.

DAY 4

9:00 AM Exit Briefing

- * NRC position with regard to nine Supplement 1 to NUREG-0737 Requirements at Browns Ferry Nuclear Plant



