UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W., SUITE 2900
ATLANTA, GEORGIA 30323-0199

Report Nos.: 50-259/94-21, 50-260/94-21, and 50-296/94-21

Licensee: Tennessee Valley Authority
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1101 Market Street
Chattanooga, TN 37402-2801

Docket Nos.: 50-259, 50-260, and 50-296

License Nos.: DPR-33, DPR-52, and DPR-68

Facility Name: Browns Ferry 1, 2, and 3

Inspection Conducted: September 12-16, 1994

Inspector: L. S. Mellen, Reactor Engineer, DRS — Date Signed: 9/22/94

Inspector: L. P. King, Reactor Engineer, DRS — Date Signed: 10/3/94

Inspector: L. Trocine, Reactor Engineer, DRP FOR — Date Signed: 9/22/94

Accompanying Personnel: G. Bryant, Comex

Approved by: Paul J. Kellogg, Chief
Operational Programs Section
Operations Branch
Division of Reactor Safety — Date Signed: 10/5/94

Enclosure

SUMMARY

Scope:

This was a special, announced emergency operating procedure follow-up inspection and Unit 3 control room design review. The inspection was to verify that previous comments on the Browns Ferry emergency operating instructions were appropriately dispositioned, that the emergency operating instructions were technically accurate, and that their specified actions could be accomplished using existing equipment, controls, and instrumentation. Additionally, the inspection was to review the human factors associated with the control room design review, "Three Mile Island Action Item I.D.1."

Results:

The inspectors concluded that Browns Ferry had done a particularly thorough follow-up on previously identified emergency operating procedure items. The documentation was complete and nearly always contained the appropriate resolution of the comments. The few areas that required additional follow-up or clarification are contained in the report. Additionally, the inspectors concluded that the control room design review for Unit 3 was adequate.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*T. Abney, Technical Support
W. Anderson, Auxiliary Unit Operator
S. Austin, Site Licensing
*B. Baggett, Shift Operating Supervisor
J. Beasley, Nuclear Assurance and Licensing
J. Bennett, Simulator Instructor
*D. Bradley, Lead Engineer/Nuclear Engineering
*A. Burnette, Operations
G. Christopher, Assistant Shift Operating Supervisor
J. Casey, Auxiliary Unit Operator
D. Dyar, Recovery Project Engineer
J. Hall, Simulator Instructor
*H. Hatton, Outage Engineer
*J. Johnson, Quality Assurance
*R. Jones, Operations
S. Kane, Regulatory Licensing Manager
*J. Maddox, Maintenance/Modifications
*D. Matherly, Operations Procedure Manager
*J. McCarthy, Regulatory Licensing Manager
M. Meek, Simulator Instructor
*R. Moll, Operations Manager
*P. Salas, Licensing Manager
*D. Stenson, Recovery
*J. Valenta, Recovery Engineering
*R. Wells, Compliance Licensing Manager

Other licensee employees contacted included engineers, technicians, operators, and trainers.

NRC Personnel

L. Wert, Senior Resident Inspector
*J. Munday, Resident Inspector

*Attended exit interview

2. Management Control of Emergency Operating Instructions and Abnormal Operating Instructions

The inspectors reviewed Procedure SSP-12.16, "Emergency Operating Instruction Control," Revision 3, dated March 21, 1994. The procedure established administrative controls and provided requirements for unit specific EOI program manuals, the EOI maintenance program, and the EOI verification and validation program.

The inspectors concluded that Procedure SSP-12.16, provided adequate instruction and program guidance except that it did not specifically require the updating of the RPV variables used in Contingency 4, Reactor Pressure Vessel Flooding. The calculation for the minimum core flooding interval required a value for the mass of fuel in the vessel. The Browns Ferry response to this item stated, "TVA acknowledges that this evolution should be verified prior to each start-up following reload." This evolution was required and was not covered by procedures. Prior to the end of this inspection, the licensee had initiated a change to the corporate procedure which controlled fuel mass data changes. This change required the corporate nuclear engineering staff to notify the EOI coordinator. These changes adequately addressed the lack of administrative control for fuel mass data.

3. Control Room Design Review

The inspectors evaluated the DCRDR program with particular emphasis on the interface with the EOI program and the Unit 3 DCRDR program status. The inspectors reviewed Supplement 1 to NUREG-0737, NUREG-0700, and the associated correspondence between TVA and the NRC concerning the DCRDR program. HEC/HED source record files and the control board mockups were examined. The inspectors met with several DCRDR team members and contacted several licensed control room operators concerning the DCRDR program. Eleven HEDs were selected for a results comparison between the Unit 2 and Unit 3 control rooms.

The inspectors found the following:

a. Paragraph 1.2.3 of Procedure 0-TI-268, "Dispositioning Control Room HECs and HEDs," Revision 0, dated December 31, 1991, exempted a set of HEDs from the requirement for closure packages. The intent was to avoid the need to originate closure packages for Unit 2 HEDs already completed as of the procedure promulgation date. The inspectors determined that the paragraph should apply only to Unit 2. The licensee concurred and initiated a procedure change. The licensee currently plans to implement this procedure change by October 31, 1994 (TVA BFN tracking system TROI SLT 94 0911 001).

b. Several HEDs with the potential to impact EOIs were applicable to Unit 2 only (e.g., HED Nos. 299, 300, 301, 302, 303, 304, 305, 307, and 308). No equivalent Unit 1 or 3 HEDs exist. Although the inspectors recognize that the Unit 3 EOI program will begin with EOIs that are essentially duplicates of Unit 2 EOIs, an effort which might yield effective transfer of these HEDs; it appeared appropriate that these HEDs should be reviewed to determine whether applicability should be extended to Units 1 and 3. Licensee staff members stated that they would review these as appropriate.

c. Since the Unit 3 SPDS initiative is incomplete, DCRDR coordination with the SPDS initiative is incomplete. It was programmed and was being accomplished. This will be reviewed when the SPDS is completed.

d. An unknown number of category 3 or 4 HEDs were accomplished at Unit 2 but not at Unit 3 prior to TVA's withdrawal of the commitment to complete all category 3 or 4 HEDs with a positive cost/benefit ratio. No closure records or consolidated list of closed category 3 or 4 HEDs exists. No new work will be initiated on category 3 or 4 HEDs at Unit 3. No effort will be made to evaluate those HEDs accomplished at Unit 2 and applicable to, but unaccomplished at Unit 3. Unless this area is evaluated, the two units may actually diverge as a result of the application of the DCRDR program. As examples, the inspectors concluded that category 3 or 4 HED Nos. 002, 197, 274, 301, 304, 307, 310, 013, 093, and 172, were probably accomplished at Unit 2. The inspectors were unable to determine whether they had or had not been accomplished at Unit 3 due to the absence of closure records. A review of these packages indicated they would have only minor impact on unit specific differences. The inspectors found no evidence of any significant changes that were not accomplished or scheduled to be accomplished on both units.

Based upon their review, the inspectors determined the following. The licensee initiated a revision to address a minor procedural problem. DCRDR coordination with the Unit 3 SPDS system was incomplete but in progress. Two more additional problems were noted. One concerned some problems with the DCRDR/EOI interface, and the other involved a potential for Units 2 and 3 to diverge because of the completion of some HEDs at Unit 2 but not at Unit 3. The licensee was aware of both of these problems, and they had been addressed by TVA and NRC correspondence. Based on this review, the previous approval of the Unit 2 DCRDR, and the similarity of the Unit 2 and Unit 3 programs, TMI Action Item I.D.1 is closed for Unit 3.

4. Licensee actions on Previously Identified Items

(Closed) IFI 50-260/92-27-01, "Follow-up on Emergency Operating Instructions Program."

The inspectors reviewed the Browns Ferry response to NRC Inspection Report No. 50-260/92-27. This 64 page document detailed the licensee's response to the previously identified EOI program comments. The inspectors concluded that Browns Ferry had done a particularly thorough follow-up on previously identified EOI items. The documentation was complete and nearly always contained the appropriate resolution of the comments. The few areas that required additional follow-up or clarification are listed below:

a. EOI-4, Radioactive Release Control Guidelines

The original NRC inspection report stated the following:

> Entry condition - Table 5, Radioactive Release Rates, required verification of iodine levels. This step was inconsistent with emergency action level RG1 of EPIP-3, Attachment 1, which stated verify Iodine 131 Equivalent. Since these terms were not equivalent, the correct term should be referenced in both places to keep the EPIPs and EOIs consistent.

The original Browns Ferry response stated the following:

> Table 5, Radioactivity Release Rates, was changed from "I-131 Equivalent" to "Iodine" in Rev. 2 of EOI-4 to be consistent with the correct term in Emergency Action Level RG1 of EPIP-3.

The inspectors reviewed the applicable procedures and procedure changes. Although the reference to iodine levels in Table 5 of EOI-4 was not actually changed, Revision 2 of Step RR-6 changed the reference from "I-131 Equivalent" to "Iodine" on April 21, 1993. This matched the iodine references in the emergency classification flowchart for radioactive levels abnormal/radiological effluents in revision 13 of Procedure EPIP-1, "Emergency Plan Classification Logic," dated July 1, 1992. In addition, the licensee changed both Table 5 and Step RR-6 to incorporate the changes required by 10 CFR Part 20 on November 10, 1993. The licensee also revised the emergency classification flowchart to incorporate the 10 CFR Part 20 requirements. These changes reinstated the reference to I-131 concentration in Step RR-6 of EOI-4 and the General Emergency portion of the emergency classification flowchart and left the reference to "Iodine" in Table 5 of EOI-4 and in the Alert portion of the emergency classification flowchart.

As a result of these discrepancies, the licensee immediately changed the emergency classification flowchart and began processing an EOI program manual change request form for EOI-4 to specify "I-131 Concentration" versus "Iodine Levels." The licensee currently plans to implement the changes to EOI-4 before the restart from the Unit 2 Cycle 8 refueling outage.

b. Abnormal Operating Instruction 2-AOI-79-2, "Inadvertent Criticality During Incore Fuel Movements," Revision 7, dated June 9, 1993

The original NRC inspection report stated the following:

Step 4.2.1 - This step directed the operator to place a fuel assembly in the SFSP if unexpected criticality occurred. This step was not appropriate for incore fuel shuffling since there was no analyzed location in the SFSP to place the assembly.

The original Browns Ferry response stated the following:

Step 4.2.1 was moved to Step 4.2.2 and changed in Rev. 06, to add clarity for the appropriate action to be taken during an unexpected criticality.

The inspectors question several operators on what was meant in Step 4.2.2 by the statement, "REMOVE the fuel assembly AND immediately PLACE it in a safe condition." The inspectors received several different interpretations of what actions were required to be taken to accomplish this step. The training personnel and the EOI writers also had different interpretations.

The licensee told the inspectors that it planned to revise the AOIs to include appropriate instructions and that these instructions would include the appropriate steps for critical conditions when the bundle is latched or unlatched. Prior to the end of the inspection, the licensee had a procedure revision drafted. This draft included appropriate instructions.

c. Entry Conditions for 2-EOI-Appendix-7H, "Alternate RPV Injection System Lineup - RCIC Using Auxiliary Steam."

The original NRC inspection report stated the following:

Step 3 - This step stated, "Notify personnel to place two auxiliary boilers in service, if available." This step did not include a procedural reference or instruction for placing the auxiliary boilers in service or what actions are required if two boilers are not available. BFN personnel stated they would evaluate the need for appropriate administrative controls to ensure the number of auxiliary boilers would be commensurate with the requirements of this appendix.

The original Browns Ferry response stated the following:

BFN normally maintains auxiliary boilers available for drywell purging, unit startup, and unit shutdown. Because two boilers are normally available for service, no further action is necessary. Operations personnel are trained in auxiliary boiler operation under the guidance of Operating Instruction, 0-OI-12.

Under circumstances in which two auxiliary boilers cannot be made available, then EOI Appendix-7H cannot be performed, and the SRO uses his own discretion based on training and plant knowledge to take alternative action.

The inspectors found that training and the EOI procedures group had different expectations of what the operators would do depending on how many auxiliary boilers were available. The licensee stated that the correct instructions were to use the HPCI if two auxiliary boilers were available and the RCIC if one or two were available. Procedure revisions were in process by the end of this inspection.

The inspectors concluded that the licensee had adequately responded to the above items. The balance of the EOI program changes were adequately dispositioned. This item is closed.

5. Exit Interview

The inspection scope and findings were summarized on September 16, 1994, with those persons indicated in paragraph 1. The NRC described the areas inspected and discussed in detail the inspection findings listed below. No proprietary material is contained in this report. No dissenting comments were received from the licensee.

ITEM NUMBER	STATUS	DESCRIPTION
50-260/92-27-01	Closed	Follow-up on EOI Program

APPENDIX A

ACRONYMS

AOI	Abnormal Operating Instruction
BFN	Browns Ferry Nuclear
CFR	Code of Federal Regulations
DCRDR	Detailed Control Room Design Review
EOI	Emergency Operating Instruction
EPIP	Emergency Plan Implementing Procedure
HEC	Human Engineering Concern
HED	Human Engineering Deficiency
HPCI	High Pressure Coolant Injection
I	Iodine
IFI	Inspector Follow-up Item
NRC	Nuclear Regulatory Commission
OI	Operating Instruction
RCIC	Reactor Core Isolation Cooling
RG1	Initial Condition for Radiation Levels Abnormal General Emergency
RPV	Reactor Pressure Vessel
RR	Radioactive Release
SFSP	Spent Fuel Storage Pit
SPDS	Safety Parameter Display System
SRO	Senior Reactor Operator
SSP	Site Standard Practice
TI	Technical Instruction
TMI	Three Mile Island
TVA	Tennessee Valley Authority

Enclosure