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

Report Nos.: 50-390/94-86 and 50-391/94-86

Licensee: Tennessee Valley Authority
6N 38A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Docket Nos.: 50-390 and 50-391 License Nos.: CPPR-91 and CPPR-92

Facility Name: Watts Bar Nuclear Plant Units 1 and 2

Inspection Conducted: December 19-22, 1994

Inspector: Larry S. Mellen 1/5/95
Larry S. Mellen, Reactor Inspector Date Signed

Inspector: Larry P. King 1/5/95
Larry P. King, Reactor Inspector Date Signed

Approved by: Paul Kellogg 1/5/95
Paul Kellogg, Chief Date Signed
Operational Programs Section
Operations Branch
Division of Reactor Safety

Approved by: Caudle A. Julian 1/5/95
Caudle A. Julian, Chief Date Signed
TVA Operations Branch
Division of Reactor Projects

SUMMARY

Scope:

This was a routine announced Emergency Operating Procedure (EOP) follow-up inspection. Its purpose was to verify that previous NRC comments on Emergency Operating Procedures were appropriately dispositioned. There will be an additional EOP inspection that will focus on EOP Human Factors and will be completed when the control design modifications and component labeling is completed.

Enclosure

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Results:

The inspectors concluded that the licensee had made reasonable progress in completing Emergency Operating Procedure open items. The items that were remaining were generally human factors items that will be reviewed during the Emergency Operating Procedure Human Factors inspection.

Violations or deviations were not identified in this report.

Enclosure

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*J. Bushnell, Licensing Engineer
*D. Nunn, Vice President, New Plant Completion
*P. Pace, Compliance Licensing Manager
*J. Scalice, Vice President, Watts Bar
*G. Seaman, Operations Procedures
*T. Stockdale, Operations Superintendent
*R. Wiggall, NE Safety Analysis

Other licensee employees contacted included engineers, technicians, nuclear power supervisors, and construction supervisors.

NRC Personnel

*K. Ivey, Resident Inspector
J. Lara, Resident Inspector
*G. Walton, Senior Resident Inspector

*Attended exit interview

Acronyms and Abbreviations used throughout this report are listed as an Attachment

2. Followup on Previously Identified Items

a. IFI 50-390/93-30-01

(Closed) Items to be included in the licensed operator training program

(1) There were five procedures that were not included in the original EOP set. These were:

* ES-0.0 Re-Diagnosis

* ES-0.3 Natural Circulation Cooldown with Steam Void in Vessel (with RVLIS)

* ES-0.4 Natural Circulation Cooldown with Steam Void in Vessel (without RVLIS)

* ES-3.3 Post-SGTR Cooldown Using Steam Dump

* ECA-3.3 SGTR Without Pressurizer Pressure

All five of these procedures have been issued. The licensee has trained on all of these. The inspectors verified the procedures conformed to the Emergency Response Guidelines or the licensee provided acceptable justification for deviations from the guidelines.

(2) Additionally, there were 2 AOIs that required revision before inclusion in operator training.

a) AOI-7, MAXIMUM PROBABLE FLOOD

The inspectors reviewed AOI-7, Revision 10, and were informed that the procedure would be replaced with 11 procedures. These procedures were:

* AOI-7.01, Maximum Probable Flood
* AOI-7.02, Flood Mode Head Removal and Cavity Filling
* AOI-7.03, Flood Mode CVCS and WDS Tank Filling Instructions
* AOI-7.04, Flood Mode Secondary Plant Shutdown
* AOI-7.05, Flood Mode Cold Leg Accumulator Venting and Filling
* AOI-7.06, Alignment of HPFP Water to the Steam Generators
* AOI-7.07, Shutdown of CCS and Change Over to ERCW
* AOI-7.08, Securing of Radiation Monitoring Instruments
* AOI-7.09, Mode Selector Switch Alignment
* AOI-7.10, Flood Mode Electrical Systems Alignment
* AOI-7.11, Alignment of Auxiliary Building Lighting

At the time of this followup inspection these procedures had not been issued. The procedures will be reviewed during the EOP human factors inspection. This is identified as part of IFI 50-390/94-86-01, Items to be completed during the EOP human factors inspection.

b) AOI-27, MAIN CONTROL ROOM INACCESSIBILITY

The inspectors reviewed AOI-27, Revision 11, and were informed that the procedure would be incorporated into AOI-30, Plant Fires. At the time of this followup inspection AOI-30 had not been revised. The revised procedure will be reviewed during the EOP human factors inspection. This is identified as part of IFI 50-390/94-86-01, Items to be completed during the EOP human factors inspection.

(3) Items to be completed prior to June 28, 1993.

The final portion of this IFI concerned 61 items that were to be evaluated prior to June 28, 1993. This list of items was documented in a letter from TVA to NRC dated June 18, 1993. The letter provided a disposition for each of the 61 items. The inspectors verified that each item had been dispositioned appropriately by either verifying a procedure change, verifying a field change, verifying that an NCR had been issued and closed, or verifying a change was not required. The inspectors confirmed that all 61 of these items had been appropriately dispositioned.

This IFI is closed. The incomplete portions are identified in the above paragraphs and will be tracked as part of IFI 50-390/94-86-01.

b. IFI 50-390/93-30-02

(Closed) Items to be completed prior to fuel load. There were no specific items identified in the 50-390/93-30 Inspection Report that were to be completed prior to fuel load. This inspection did not add anything to this category. This item is closed.

c. IFI 50-390/93-30-03

(Closed) Items to be completed prior to the NRC EOP human factors review in late 1993.

The original EOP inspection identified approximately 351 additional comments that were to be resolved prior to the EOP human factors review. In a letter to NRC dated June 18, 1993, the licensee indicated that 160 of the original comments which were on EOPs would be dispositioned prior to June 28, 1993. The inspectors reviewed TVA tracking document T20 930630 990, dated June 21, 1993, which delineated the AOIs and EOIs that were approved by the Plant Operations Review Committee on June 18, 1993. These procedures were revised to incorporate comments from the original EOP inspection. The inspectors verified that a representative sample of the items had been dispositioned appropriately by either verifying a procedure change, verifying a field change, verifying that an NCR had been issued and closed, or verifying a change was not required.

The remaining approximately 190 items to be completed prior to the EOP human factors review is identified as part of IFI 50-390/94-86-01, Items to be completed during the EOP human factors inspection.

d. URI 50-390/93-30-04

(Closed) Management control of the implementation of the design control process.

During the initial review of EOPs the inspectors questioned the adequacy of guidance provided for the use of a backup cooling water

system for Centrifugal Charging Pump 1A-A. This question appeared to be caused by a design change, for installation of the backup cooling water system, being incomplete. This brought into question management control of the implementation of the design control process.

The backup cooling water system, which provides an alternate cooling path to the centrifugal charging pump oil coolers from the ECRW was designed and installed in 1985 via ECN 5698, and FCR NP-807. It was installed in response to a scenario in which a loss of the CCS pumps was postulated due to a sabotage event. This was considered credible since at that time non-security cleared construction personnel would have been working in the plant. The separation between the security area and non secured areas was only planned to be a fence in the Auxiliary Building while Unit 2 work was being completed. The event postulated personnel in the Unit 2 area breaching the fence and disabling the CCS pumps.

Later design eliminated the internal security fence. Although the original condition prompting the modification no longer exists, the modification was determined to be useful for reliability reasons and was kept. This feature was included in the WBN PRA.

The inspectors requested to see calculations that documented there would be adequate flow through this alternate path and that automatic control devices in the flow path would not actuate to impede flow. The licensee agreed to search the design files and provide the calculations.

The licensee's search for original calculations was unsuccessful. A new calculation was issued to verify adequate cooling flow. The inspectors reviewed the calculation (EPM-DLB-061193) and determined that there was adequate flow.

The temperature capability of the backup cooling water system was also questioned. The normal cooling water temperature requirement to the centrifugal charging pump oil coolers is 100°F, with temperature excursions to 120°F being acceptable. The inspectors reviewed correspondence from Westinghouse that stated that these values were correct. The ERCW operating mode calculation indicated that the ERCW temperature would be 110°F on the discharge of the CCS Pump Room 1A cooler when the ERCW supply temperature is 85°F. This 85°F temperature is the maximum expected ERCW temperature since the source is river water. Therefore, the capability of the backup cooling water system to satisfy the temperature requirements of the pump oil coolers is assured. There are two automatic FCVs in the flow path, 1-FCV-67-127 and 169. Both have been disabled so that they will be maintained in the design required open position.

The design control process has been improved since the above change was implemented. The current design change control procedure, EAI-3.05, "Design Change Notice", requires that all supporting

calculations and documents be complete when the design change is implemented. In addition, the CVCS and CCS system descriptions have been revised to discuss the cross tie, the note on drawings 1-47W845-4 (ERCW) and 1-47W859-4 (CCS) which indicated the cross tie was temporary pending Unit 2 operation has been removed, and FSAR sections 9.2.1.2 (ERCW) and 9.3.4.2.4 (CVCS) have been revised to describe the connection. These changes were made by DCN S-33402-A and FSAR change package 1147.

The inspectors reviewed applicable portions of the revised IPE. Several sequences which had been considered important in the original IPE submittal are no longer considered significant contributors to the CDF. These sequences are still contained in the PRA; however, their relative contribution has diminished. The most significant factor was that recent design basis calculations for the CCS system have demonstrated that Train A only requires one pump in order to ensure adequate flow and cooling capability during power operation. The original IPE assumed that both pumps in CCS Train A were necessary. The inspector reviewed the flow requirements and determined that there was adequate flow with one pump operation. In addition the licensee assumed a 10 percent degradation of the pump. The new calculations have lead to a significant decrease in the calculated unavailability of CCS. Since this train provides cooling to all the RCPS and to the Train A ECCS pumps, this improved availability results in a significant reduction in the CDF due to these events.

The inspectors walked down Appendix B of AOI-15 Rev.13, "Loss of Component Cooling Water". This Appendix was the alignment of ERCW to 1A-A CCP Lube Oil Heat Exchanger. The inspectors verified that the Appendix accomplished the stated purpose. The licensee had used this Appendix as a JPM for training the operators.

This URI is closed.

3. Exit Interview

The inspection scope and findings were summarized on December 21, 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	Description, Paragraph
IFI 50-390/94-86-01 (Open)	Items to be completed during the EOP human factors inspection. (Paragraph 2.a, 2.c)
IFI 50-390/93-30-01 (Closed)	Items to be included in the licensed operator training program. (Paragraph 2.a)
IFI 50-390/93-30-02 (Closed)	Items to be completed prior to fuel load. (Paragraph 2.b)

IFI 50-390/93-30-03 (Closed)	Items to be completed prior to the NRC EOP human factors review in late 1993. (Paragraphs 2.c)
URI 50-390/93-30-04 (Closed)	Management control of the implementation of the design control process. (Paragraph 2.d)

LIST OF ACRONYMS AND ABBREVIATIONS

AOI	Abnormal Operating Instruction
CCS	Component Cooling Water System
CDF	Core Damage Frequency
CVCS	Chemical and Volume Control System
DCN	Design Change Notice
ECCS	Emergency Core Cooling System
ECN	Engineering Change Notice
EOI	Emergency Operating Instruction
EOP	Emergency Operating Procedure
ERCW	Essential Raw Cooling Water System
FCR	Field Change Request
FCV	Flow Control Valve
IFI	Inspector Followup Item
IPE	Individual Plant Evaluation
JPM	Job Performance Measure
NCR	Non Conformance Report
NRC	Nuclear Regulatory Commission
PRA	Probabilistic Risk Assessment
RCPS	Reactor Coolant Pump Seals
RVLIS	Reactor Vessel Level Indication System
URI	Unresolved Item
WBN	Watts Bar Nuclear Plant