UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

Report Nos.: 50-390/83-54 and 50-391/83-43

Licensee: Tennessee Valley Authority
500A Chestnut Street
Chattanooga, TN 37401

Docket Nos.: 50-390 and 50-391

License Nos.: CPPR-91 and CPPR-92

Facility Name: Watts Bar 1 and 2

Inspection at Watts Bar site near Spring City, Tennessee

Inspectors: _____ 1/23/84
W. B. Swan, Senior Resident Inspector-Construction Date Signed

_____ 1/23/84
W. E. Holland, Resident Inspector-Operations Date Signed

Approved by: _____ 1/23/84
C. A. Julian, Section Chief Date Signed
Division of Project and Resident Programs

SUMMARY

Inspection on November 28 - December 24, 1983

Areas Inspected

This routine inspection involved 286 inspector-hours on site in the areas of surveillance tours and construction in Units 1 and 2; surveillance tours of preoperational testing preparations in Unit 1; review of preoperational test procedures; review of technical specifications; independent inspection effort; licensee action on previous inspection findings; review of licensee identified items; licensee action on previous enforcement items; and inspection of soil stabilization barrier.

Results

Of the nine areas inspected, no violations or deviations were identified.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

R. M. Pierce, OEDC Project Manager for Watts Bar
W. T. Cottle, Power Plant Superintendent
*G. Wadewitz, Construction Project Manager
R. C. Miles, OEDC Project Management Office
*H. J. Fischer, Construction Manager
S. Johnson, Jr., Quality Manager - Construction
E. L. Burke, Assistant Construction Engineer
C. O. Christopher, Assistant Quality Manager - Construction
J. C. Cofield, Assistant Quality Manager - Construction
E. R. Ennis, Assistant Power Plant Superintendent
*W. L. Byrd, III, Plant Compliance Supervisor
*T. W. Hayes, Nuclear Licensing Unit Supervisor
L. B. Kuehn, Preoperational Test Supervisor
*A. W. Rogers, Supervisor, Site QA Unit
*J. E. Englehart, Nuclear Power Compliance Staff, Engineer
J. J. Wilder, Design Engineer

Other licensee employees contacted included 17 engineers, technicians, nuclear power supervisors and construction supervisors.

*Attended exit interview.

2. Exit Interview

The inspection scope and findings were summarized on December 21, 1983, with those persons indicated in paragraph 1 above.

3. Licensee Action on Previous Enforcement Matters

a. (Closed) Deviation (390/80-26-01) Test Acceptance Criteria Commitments for Performance of Low Pressure Blowdown Portion of the Upper Head Injection (UHI) System Test. A letter from L. M. Mills, to L. S. Rubenstein dated March 21, 1980, committed TVA to the provision of test acceptance criteria for evaluating the low pressure blowdown portion of the Upper Head Injection (UHI) system test at Watts Bar with respect to the Sequoyah Unit 1 performance. Also, the Sequoyah Unit 1 water level setpoint was committed to be utilized at Watts Bar.

Subsequently, however, as of July 6, 1980, the UHI system low pressure blowdown test was performed without provisions of the test acceptance criteria to the personnel performing the test and without utilization of the Sequoyah Unit 1 water level setpoint.

In order to preclude reccurence of the preceding deviation, the licensee reviewed engineering/design (EN/DES) procedures which require that acceptance criteria be available prior to EN/DES approval of preoperational test instructions. A special precaution was added to EN/DES EP-6.01 to further ensure that acceptance criteria have been identified to the test director prior to test performance. The licensee also informed the inspector that Westinghouse has completed a complete reevaluation of the UHI Emergency Core Cooling System analysis and pressure calculations. All variables and assumptions were reaffirmed which resulted in a change to the scoping documents and acceptance criteria for the test. The inspector reviewed the test procedure and verified that proper changes had been incorporated. The inspector considers that all actions required to complete this item have been accomplished by the licensee. This item is closed.

b. (Closed) Unresolved Item (390/81-13-01) Impact of Instrumentation Performance on Test Assumptions for Upper Head Injection System (UHI). The licensee informed the inspector that Westinghouse has completed a complete reevaluation of the UHI Emergency Core Cooling System analysis and pressure calculations. All variables and assumptions were reaffirmed which resulted in a change to the scoping documents and acceptance criteria for the test. The inspector reviewed the test procedure and verified that the proper changes had been incorporated based on the change of scope and acceptance criteria. The inspector considers that all actions required to complete this item have been accomplished by the licensee. This item is closed.

c. (Closed) Unresolved Item (390/82-05-05; 391/82-03-05) Identification of Incomplete Work on Systems Prior to System Turnover. The licensee informed the inspector that the system walkdown process and incomplete work identification process was incorporated into the construction quality assurance (QA) program in April 1982. The inspector reviewed the QA document (Quality Control Instruction 1.22) and considered that the document provided adequate instructions and verifications to effect proper system transfers to the Division of Nuclear Power. The inspector concluded that greater emphasis has been placed on system walkdown and documentation review prior to turnover. The inspector verified that the deficiency relating to invalidation of a preoperational test due to construction work after the preoperational test was conducted was properly documented (TVA Nonconformance Report W-79-P) and that the proper corrective action was taken. The inspector considers that all actions required to close this item have been accomplished by the licensee. This item is closed.

d. (Closed) Unresolved Item (390/82-35-03; 391/82-32-02) Licensee Reviews of Apparent Pipe Support Deficiencies and Methods to As-Constructed Support Drawing. The NRC inspector asked that the licensee review specific concerns on inspection of pipe supports 47A464-3-135 and 47A464-3-127; and review administrative controls used to accept support details which deviate from "A" size drawing detail but meet 47A050 series drawing notes.

The initial response, by the hanger engineering unit coordinator, referenced NCR 4436 R which asked for as-constructed dimensional changes to the drawing for support 47A464-3-135. The drawing changes were accomplished under ECN 3707.

The site construction manager on December 29, 1982, requested engineering design (EN DES) to answer his questions on control of drawing deviation. EN DES's response, dated July 19, 1983, explained that the 47A series drawings are typical drawings for a fairly standard type of support and that notes on these drawings and on 47A050 series companion drawings are sufficient to authorize deviations and define criteria for their acceptance. Any deviation or accumulation of deviations within the tolerances of the drawing notes and General Construction Specifications N3C-912 and G-43 are allowable.

The load specified on a support of this "standard" type is the design load and the components are sized based on this load. As long as the applied load does not exceed 110% of the design load, recalculation for design is not required.

The senior resident inspector reviewed the responses and found that the licensee's design and inspection controls are adequate for such supports.

This item is closed.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Dams (Soil Liquefaction Barriers) Observation of Work (45063)

The senior resident inspector, construction, made three inspections of backfill operations west and northwesternly of the intake pumping station. Excavation to the foundation shale formation reached a depth considerably below the base of the designated compacted clay dam; so approximately twelve feet of backfill was required to be made with compacted crushed rock. Because of severe, wet weather conditions, backfill operations were then suspended. No date for resumption of the work has been set.

No violations or deviations were identified during inspection of backfill compaction work.

6. Independent Inspection Effort (92706)

The resident inspectors made periodic routine surveillance tours of the power blocks of Units 1 and 2. No violations, deviations or unresolved items were identified during these surveillance tours. The resident inspector (operations) started review of final drafts of TVA submittals of changes to the Safety Evaluation Report (SER).

7. Preoperational Test Program Implementation (71302)

The inspector conducted plant tours of Unit 1 and associated areas shared by both units. The inspections concentrated on general plant/equipment conditions, preoperational activities in progress, cleanliness controls, maintenance of safety-related equipment and proper control of systems secured for maintenance. The inspector also verified that a preoperational test schedule is being maintained and is current. Within the areas inspected, no violations or deviations were identified.

8. Comparison of As-Built Plant to FSAR Description (37301)

The inspector conducted a walkdown of the Upper Head Injection (UHI) System for Unit 1. During the walkdown, the system was inspected for conformance with TVA Drawing 47W811-2, Rev. 13 (Flow Diagram, Mechanical SIS, Upper Head Injection). The TVA Flow Diagram was then compared to the FSAR, Figure 6.3-5, and the following discrepancies were noted:

a) A vent connection (valve 87-550) is located at the high point on the line connecting the water accumulator and the gas accumulator; however, the FSAR diagram (Figure 6.3-5) does not show this connection.

b) Vent valves are shown installed on the four UHI lines after they enter the refueling cavity prior to the first grayloc fitting connection on each line per the FSAR, Figure 6.3-5; however, there is only one vent valve installed on one of the four lines.

c) Local pressure indication for the surge tank is shown in FSAR, Figure 6.3-5; however, this equipment is not installed.

d) Level instrumentation was not installed on the water accumulator (four switches) and the standpipe located at the rupture disk assembly.

The inspector discussed the preceding discrepancies with the licensee and determined proper procedural controls were in place for the design changes and the required changes to the FSAR are being reviewed for submittal to NRR. Within the areas inspected at this time, no violations or deviations have been identified.

9. Followup on Licensee Identified Items (LII) (92700)

a. (Closed) LII (CDR 390/81-41; CDR 391/81-40) Inadequate Freeze Protection - WBRD-50-390/81-41; WBRD-50-391/81-40. On April 13, 1981, the licensee gave notice of the subject deficiency identified under NCR WBN MEB - 8104. "Freezing of ERCW lines in standby ERCW pumps will render these pumps unavailable, thereby, jeopardizing plant safety." Electrical design did not require heat tracing.

Under ECN-2756, TVA redesigned the piping to the ERCW pump motor bearing cooler to be self-draining; thus the heat trace requirement was eliminated. A study was performed on the potential ice formation in the main ERCW headers which resolved that ice formation would not be a problem. NCR MEB 8104 R1 was closed on February 24, 1983.

Piping revisions under Work Plan No. 3208 were completed November 16, 1983, and accepted by mechanical QC inspection on November 17, 1983. The resident inspector has reviewed confirming documentation. The subject CDR is closed.

b. (Closed) LII (CDR 390/81-53; CDR 391/81-51) Class IE Electrical Components for ERCW Traveling Screens. On May 18, 1981, the licensee gave notice that some electrical components on traveling screens at the intake pumping station were not rated Class IE as required by FSAR Section 9.2.2. Correction under NCR WBN NEB 8112 involved replacement of the motors and circuit breakers and revision of circuitry under ECN 3429 so that a speed detector switch failure will not affect operation of the screen drive motors. The replacement motors are 5 HP 460 V and nuclear service rated.

The senior resident inspector-construction on December 16, 1983, verified by field inspection and document review that adequate corrective measures had been completed. This item is closed.

c. (Closed) LII (CDR 390/82-79; CDR 391/82-75) Defective GE Type HFA Relay Coils - WBRD-50-390/82-79; WBRD-50-391/82-75. The licensee on July 22, 1982, under NCR WBN EEB 8206, notified NRC that their supplier, General Electric, had advised TVA of potential failure of GE type HFA relays manufactured between 1974 and 1979. TVA found that 110 of these relays were furnished on the Class IE 6.9-KV switchgear. Twenty-seven of these were found to have cracked coils. The decision was made to modify the relays by installing GE Century-series magnetic assembly.

Replacements were made under work plan 3053, closed on November 4, 1983, and work plan 3068, closed on November 21, 1983.

After consultation with RII technical staff, the senior resident inspector - construction, concluded that the licensee's corrective actions were acceptable. This item is closed.

d. (Closed) LII (CDR 390/82-89) Incorrect Insulation Weights Used in Piping Analysis - WBRD-50-390/82-89. The subject potential deficiency was reported to NRC on August 25, 1982, initiated by NCR WBN CEB 8223 and related NCR WBN SWP 8247. Design drawings detailing insulation requirements had not been issued for all rigorously analyzed piping. Insulation data used were acquired from various uncontrolled sources.

For Unit 1, TVA issued engineering change notice (ECN) 3620 for use in the preparation of insulation drawings (i.e., QA documents) to substantiate insulation data for use in rigorously analyzed piping problems. All insulation drawings have been issued and the insulation data have been compared to the data which were used in existing piping analyses. All rigorously analyzed piping, which was part of the evaluation program initiated in response to NRC-OIE Bulletin 79-14, has received insulation review. No reanalysis, support load changes, or field changes were required as a result of this review for Unit 1.

TVA's investigation has shown that this deficiency could not have adversely affected the safe operation of the plant for Unit 1. Thus, TVA no longer considers 10 CFR 50.55(e) applicable for Unit 1.

The inspector has reviewed the documentation and concurs in the licensee's conclusion on non-reportability. This item is closed for Unit 1.

e. (Closed) OPN LII (390/82-30-02) Licensee Investigation of Safety-Related Hanger Inspections and Corrective Actions. On August 5, 1982, the licensee informed the resident inspector that an investigation was being conducted to determine if rejection of the installation of twenty-five hangers, by inspection personnel no longer in TVA employ, (terminated) was defensible. The inspector asked that the adequacy of upper tier acceptance criteria be addressed in response to this open item; and that programmatic deficiencies noted as a result of investigation be addressed.

Reinspection of the same pipe supports, under more clearly defined acceptance criteria resulted in voiding of eight inspection rejection notices (IRNs). Two were partially voided. Five new IRNs were issued for unacceptable conditions not previously identified. In all, nineteen supports were accepted, and six remained unaccepted. All identified deficiencies on the six unacceptable supports have been repaired and found acceptable.

In a July 21, 1983 memorandum from the design project manager to the construction project manager, the conclusion was stated that acceptance criteria in listed construction specifications and drawings are clear, well defined and adequate. The twenty-five questioned supports are all now rated acceptable. The expanded TVA program for hanger quality assurance appears adequate when properly implemented. This item is closed.

f. (Closed) LII (CDR 390/83-51; CDR 391/83-49) QA Program for the Control of Fuses - WBRD-50-390/83-51; WBRD-50-3921/83-49. The licensee reported the subject potential deficiency on August 15, 1983. Final Report dated December 21, 1983, stated:

"TVA has determined that the installation of fuses in safety-related equipment at Watts Bar (WBN) was governed by TVA's Division of Construction (CONST) procedure WBNP-QCP-3.06-2 "Internal Wiring Verification." Section 6.3.6 of this procedure requires the verification of components, including fuses, in accordance with the applicable drawings and/or specifications.

In addition, a comprehensive survey by WBN Division of Nuclear Power personnel indicated that fuse installations performed by CONST personnel were substantially correct with only minor discrepancies noted inclusive of those noted in the reported potential deficiency.

Consequently, since fuse installations were controlled by QA procedures and there are no indications of significant problems with installed fuses, TVA concludes that there is no condition adverse to safety at WBN. Therefore, TVA no longer considers this item reportable under the provisions of 10 CFR 50.55(e)."

The inspector has reviewed the documentation and concurs in the licensee's conclusion on non-reportability.

This item is closed.

10. Licensee Action on Previous Inspection Findings

a. (Closed) IFI (390/82-32-02) Followup on Corrective Actions for Hydraulic Snubber Deficiencies. This item was opened to track licensee actions and documentation pertaining to leakage on 20 hydraulic snubbers on Unit 1 steam generators. In response, the licensee replaced the original NCR 1033 R with NCR 5003; provided a chronology on the snubber leakage up to date; and provided an evaluation to show that Part 21 is not applicable. The Unit 1 snubbers had minor rework by TVA and were reinstalled but still leaked excessively. The twenty snubbers designated for Unit 2 were shipped back to the supplier for evaluation of the problem and to be reworked. They are to then be installed in Unit 1 and the twenty from Unit 1 sent back to the supplier for corrective action and later installation in Unit 2. This rework of the snubbers by the supplier and reinstallation will be performed under LII (CDR 390/83-61; CDR 391/83-56) Leaking Steam Generator Hydraulic Snubbers; WBRD-50-390/83-61; WBRD-50-391/83-56. The matter will be tracked under the CDR. This inspector follow-up item (IFI) is closed.

b. (Closed) IFI (390/82-39-03) Follow-up on HVAC Ductwork Collapse. Approximately thirty-five feet of forty-two inch, twenty gauge, spiral seam, nonwelded, slip-joint duct was collapsed during a test in October 1982, when excessive negative pressure was applied from changing pitch of blades on a fan. This duct was replaced by sixteen gauge rectangular, steel duct with reinforcing flanges. The replacement duct was tested and found to be adequate. Dampering was modified to obviate application of excessive negative pressure. Subsequently,

during hot functional testing of the HVAC system (TVA-7) for cooling the control rod drive mechanism (CRDM), it was determined that the specified 120°F temperature maximum for inlet air and 164°F outlet air temperature were not attained without reliance on relief dampers. Based on these findings and on experience at Sequoyah, TVA requested change of the limits to 190°F of outlet air and 135°F on inlet cooling air. Westinghouse, by letter dated September 16, 1983, approved raising inlet temperature to 135°F but restricted the upper limit to 185°F for outlet at the CRDM shroud. The senior resident inspector has reviewed findings of testing under TVA-7 Control Rod Drive Mechanism Cooling System, which indicate that these limits are attainable. This IFI is closed.

c. (Closed) OPN (391/80-20-04) Licensee to Establish Adequate Means of Sampling the UHI Surge Tank. The Unit 1 sample lines from the UHI accumulator tank and from the UHI surge tank (WB-DCR-NO-266) were extended to a safe, convenient location for sampling in November 1981, and OPN item 390/80-26-05 was closed in report 50-390/82-07.

Redesign of the sampling lines from the UHI accumulator tank and from the UHI surge tank (WB-DCR-NO-266) was performed under ECN 2469 in November 1981. Installation of sampling lines for Unit 2 was completed on November 19, 1983, under Work Package G043A27.

The senior resident inspector verified by field inspection that the sampling facilities have been installed for easy, safe sampling.

This item is closed.