UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA ST., N.W., SUITE 3100
ATLANTA, GEORGIA 30303

Report Nos. 50-390/83-06 and 50-391/83-05

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

Facility Name: Watts Bar

Docket Nos. 50-390 and 50-391

License Nos. CPPR-91 and CPPR-92

Inspection at Watts Bar site near Spring City, Tennessee

Inspectors: LJ Watson 3/22/83
for T. L. Heatherly, Operations Senior Resident — Date Signed

LJ Watson 3/22/83
for W. Swan, Construction Senior Resident — Date Signed

Approved by: R. T. Nelson 3/22/83
for D. Quick, Section Chief, Division of Project and Resident Programs — Date Signed

SUMMARY

Inspection on January 22, 1983 - February 22, 1983

Areas Inspected

This routine announced inspection involved 182 resident inspector-hours on site in the areas of followup on licensee identified items; licensee action on previous enforcement matters; followup on non routine events; independent inspection effort; and licensee action on previous inspection findings.

Results

Of the five areas inspected, no items of noncompliance or deviations were identified.

DETAILS

1. Persons Contacted

Licensee Employees

G. Wadewitz, Construction Project Manager
S. Johnson, Construction Quality Manager
T. Hayes, Nuclear Licensing Unit Supervisor

Other licensee employees contacted included 10 engineers.

2. Exit Interview

The inspection scope and findings were summarized on February 18, 1983, with those persons listed in paragraph 1 above. The licensee acknowleged the inspection findings.

3. Licensee Action on Previous Enforcement Matters

a. (Closed) Deviation (390/82-27-05, 391/82-24-05) Changes in Enforcement Commitments not Identified to Licensee Management and the NRC. The deviation identified removal of committed requirements for one hundred percent signal tracing of installed safety-related cable. After discussion with NRC Regional Office personnel, the licensee revised quality procedure QCP-3.05 to state that cable routing would be verified as specified on cable pull slips using the electronic signal trace method. The inspector found this corrective action acceptable.

b. (Closed) Deviation (390/82-27-06, 391/82-24-06) Changes to Previous NRC Commitments Concerning Application of Tamper Proof Paint On July 19, 1982, the licensee approved a general revision to procedures to exclude the requirement for application of tamper proof paint on junction boxes, condulets and other equipment access covers. The licensee stated in its response dated January 19, 1983, that the method proved to be ineffective because of the number of cables in junction boxes which may not be required to be terminated at the same time. As an alternate, WBNP-QCP-1.42-4 required the use of tamper proof paint on cable terminations. The inspector concurred. This item is closed.

c. (Closed) Unresolved Item (390/81-01-02, 391/81-01-02) Pressurizer Relief Valve Installation. FSAR description of the pressurizer relief valve installation indicated that a bolted flange arrangement had been used; however, design drawings and actual installation indicated a welded arrangement. The licensee indicated that the source of the FSAR statement could not be determined and explained that the basis for installation was Westinghouse and vendor approved. The FSAR was changed in Amendment 44 to reflect the correct "as built" condition. This item is closed.

d. (Open) Unresolved Item (390/81-13-06) Questionable HVAC Damper Integrity. Previously the inspector had identified an HVAC damper that was not qualified for its intended use. It was determined that the damper and several others had been removed and that TVA's Nuclear Safety Section (NSS) was investigating the matter for generic applicability and safety significance.

Further review by the licensee determined that the dampers had been previously identified as structurally unsound at Sequoyah Nuclear Plant. The dampers had failed preoperational testing due to excess leakage and blade distortion and had been nonconformed. The dampers at Sequoyah and Watts Bar were replaced with dampers of higher quality. The replacement dampers were tested. Discussion with the licensee indicated that hardware changes had been completed at Watts Bar (63 dampers replaced) but installation documentation and inspection were not completed. This item will remain open pending documentation review.

e. (Open) Unresolved Item (390/81-03-04) Justification for Residual Heat Removal System (RHR) Setpoints. The item requested the basis of setpoints utilized in the RHR system. These setpoints and limits were designed to ensure proper overpressure protection for the reactor coolant system (RCS) during solid plant operations. The licensee's response indicated that the 450 psi and 600 psi system relief valve setpoints were set for RCS overpressure protection and RHR system overpressure protection. The relief valve capacities (900 gpm and 20 gpm) were designed to relieve all charging pump flow and to relieve RHR system check valve back leakage. The 750 psi RHR inlet isolation valve setpoint (shuts valve at 750 psi increasing) was designed to prevent valve closure unnecessarily during expected pressure spikes while still maintaining pressure relief protection. Isolation valve closure time (approximately two minutes) was designed for operator response. After discussion with operations and design personnel those setpoints and interlock limits appeared appropriate. However, this inlet valve setpoint specification differed throughout design documents, testing and operational procedures. The licensee also indicated that the setpoint may again change to a setpoint of 693 psi. This item will remain open until the RHR isolation valve interlock setpoint is finalized and specified correctly throughout all applicable documents; and until pressure switch resetting and testing is completed.

f. (Open) Unresolved Item (390/81-03-11) Fire Protection System Design. In response to this item the licensee indicated that a more clearly defined philosophy was needed in the FSAR; however, the FSAR had not been amended to reflect this philosophy. This item will remain unresolved until the FSAR is amended and reviewed.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Followup on Non Routine Events

During the inspection period two bomb threats were received at Watts Bar. The licensee informed NRC officials in the Region II Office and an NRC security inspector was dispatched to the site. No bomb was located during either occurrence and licensee response to the events and subsequent documentation was appropriate. The details of the event will be provided in a special NRC report. As a result of the events the licensee plans to refine existing procedures to ensure even more effective actions.

6. Independent Inspection Effort

The inspector reviewed Division of Nuclear Power procedures to ensure that appropriate steps had been incorporated to align the RHR system from a shutdown cooling alignment to an injection alignment to mitigate the consequences of a mode 4 or 5 LOCA. Emergency Operating Instruction O was reviewed and assessed as adequate.

Procedures developed to identify and correct conditions for a loss of shutdown cooling were reviewed for adequacy. With the exception of two incorrectly specified parameters the procedure was adequate. Within the areas inspected no violations or deviations were identified.

7. Followup on Licensee Identified Items

a. (Closed) LII (CDR 390/81-87, CDR 391/81-81) Locating CCS Booster Pumps Below Flood Elevation, NCR WBN SWP 8157, WBRD-50-390/81-87, WBRD-50-391/81-81. The report identified that changes in the maximum possible flood level had not been transmitted to the appropriate designers for review. This resulted in the component cooling system reactor coolant pump thermal barrier booster pumps being installed below maximum flood level. Furthermore, the report indicated that a design criteria document had not been initiated to transmit revised information to designers.

The inspector visually verified that all four booster pumps had been raised above maximum possible level. Design Criteria WB-DC-40-42 was developed and issued October 28, 1982. The criteria provides the basis for design, procurement and qualification of plant equipment which must meet environmental, operational and licensing requirements. The inspector found the criteria's content adequate. This item is closed.

b. (Closed) LII (CDR 390/81-84, CDR 391/81-77) Alarm Setpoint on Level Transmitter, W-60-P WBRD-50-390/81-84, WBRD-50-391/81-77. The report described a condition adverse to quality in that safety injection accumulator level bellows assemblies had the potential to indicate falsely if the bellows assemblies became flooded. The recommendation by Westinghouse to invert the assemblies was verified in the field by the inspector for two of eight assemblies. Documentation on the rework was found to be acceptable for all assemblies. This item is closed.

c. (Closed) LII (CDR 390/82-40, CDR 391/82-37) Incorrect Values In Westinghouse Program UHISATAN, NEB 8206, WBRD-50-390/82-40, WBRD-50-391/82-37. The report stated that a Westinghouse computer malfunction had been discovered that potentially affected the Watts Bar FSAR LOCA accident analysis. After the computer malfunction was recognized and redeveloped, reanalysis showed that sufficient margin still existed in the peak cladding temperature and, therefore, no condition adverse to safety existed.

The report stated that Westinghouse had implemented appropriate configuration control procedures to prevent recurrence. This item is closed.

d. (Closed) LII (CDR-390/81-37, CDR-391/81-36) Incomplete Drawing Control Computer Printout, WBRD-50-390/81-37, WBRD-50-391/81-36. The report identified a breakdown in TVA's system of inputting information to a vendor drawing control computer printout. Consequently, the potential existed for pipe supports to be installed with outdated drawings. The inspector verified that adequate administrative controls had been implemented to identify and verify the adequacy of the recently developed drawing index. Subsequent to these actions, TVA plans to transfer the index to its own computerized drawing information system (DIS). This item is closed.

e. (Closed) LII (CDR-390/82-51, CDR-391/82-48) Analysis Error By Gilbert/Commonwealth, NCR WBN CEB 8214, WBRD-50-390/82-51, WBRD-50-391/82-48. The report indicated that an error had been identified involving seismic response spectra at several support locations. The error was detected during a reanalysis and corrected during implementation of Engineering Change Notice (ECN) 3174. To avoid future design errors in the application of seismic response spectra, an improved owner's review checklist was used in reviewing design calculations. This item is closed.

f. (Closed) LII (CDR-390/82-30) Incorrect Modulus of Elasticity Used In Piping Analysis Of the Auxiliary Feedwater System, WBRD-50-390/82-30. By a letter dated November 18, 1982, the licensee stated that although they had previously reported that the deficiency applied to both Units 1 and 2, the deficiency applied only to Unit 2. The deficiency for Unit 1 is closed.

g. (Closed) LII (CDR-390/82-106, CDR-391/82-100) Discrepancies In Pipe Rupture Hardware, NCR WBN CEB 8229, WBRD-50-390/82-106, WBRD-50-391/82-100. The report identified that thermal analysis of the main feedwater lines indicated possible excessive thermal movements although actual measurements under operating conditions at Sequoyah Nuclear Plant showed acceptable limits of movement.

Reanalysis utilizing the TPIPE computer program verified that the thermal movements were acceptable. Licensee records were being amended

to delete the reported nonconformance. The inspector concurred. This item is closed.

h. (Closed) LII (CDR-390/82-96, CDR-391/82-92) Interpretation Of R. T. Film On Welded Pipe By Swepco Tube Corporation, WBRD-50-390/82-96, WBRD-50-391/82-92. TVA reviewed all Swepco R. T. films, original and repeats, of piping under question. The authorized nuclear inspector reviewed and approved the piping. The reviewers determined compliance with ASME Section III and Section II, SA-655. The licensee no longer considers the condition adverse to quality. The inspector concurred. This item is closed.

i. (Closed) LII (CDR-390/82-24, CDR-391/82-22) Incomplete Tentative System Transfers, NCR's W-81-P, W-83-P, W-84-P and W-86-P. The report identified that quality procedure QCP-3.6, Standard Test 6-99, was not completed to verify system completion or to document incomplete work. This item is identical to items documented in IE Reports 390/82-05, 391/82-63, 390/82-09, and 391/82-07. The deficiency will be reviewed when the corrective actions for those reports are inspected.

j. (Closed) LII (CDR-390/82-33, CDR-391/82-30) Sheet Pile Retaining Wall at the Intake Pumping Station, NCR WBN CDB 8201, WBRD-50-390/82-33, WBRD-50-391/82-30. The report identified two errors in the final design calculations for the causeway retaining walls. Changes were made to Design Criteria WB-DC-20-19 R5.

The recalculation of the first error under the revised criteria determined that the wall anchorage system had an adequate factor of safety (1.12) against sliding under seismic loading.

The recalculation of the second error, which had indicated possible bending failure to the sheet pile walls under seismic loading, showed that the stress failure mechanism stress would be shear instead of bending. The plate was determined adequate with respect to shear forces; however, the licensee chose to reinforce the walls to preclude bending by welding two steel bars on the plate at the walls.

The inspector reviewed the details on drawing 31N 224-2 R2 and visually inspected the sheet pile retaining walls. Corrective action was determined to be adequate. This item is closed.

k. (Closed) LII (CDR-390/81-62, CDR-391/81-58) Support Drawings Designed by EDS Nuclear, WBRD-50-390/81-62, WBRD-50-391/81-58. The report identified that EDS had specified ASTM stud bolts that were not acceptable for use in TVA Class A system pressure boundaries. The licensee's corrective action included issuance of ECN 2920 to properly specify ASME-certified material. The inspector verified that drawings were correct and inspected the pressurizer safety valves in the field to ensure that new stud material was correct. This item is closed.

l. (Open) LII (CDR-390/81-11, CDR-391/81-10) Discrepancies In Hydrostatic Test Documentation, WB-M-8016, WBRD-50-390/81-11, WBRD-50-391/81-10. The report identified that a construction quality assurance audit had been conducted on safty-related system hydrostatic documentation and had discovered numerous errors. Examples included incorrect times, water temperature, applied pressure and untested piping segments. The specified corrective actions included generic review and retesting if necessary. TVA also committed to apply more stringent controls in the form of upgraded procedures and management involvement.

The inspector reviewed the revised hydrostatic test procedure and found that the procedure contained additional steps to ensure more formal control and documentation. All test documentation for high pressure fire protection (HPFP), RHR, and the containment spray system (CS) was reviewed for adequacy. Through documentation review, the inspector determined that all segments of the three systems had received hydrostatic testing. However, NCR 4190 identified that several segments within the HPFP system had been pressurized for ten minutes versus two hours as committed to by NFPA 13. All segments had been approved, "use-as-is", based on the assumption that ASME code superceded NFPA 13 requirements; however, since the NCR did not distinguish between welded and nonwelded assemblies the assumption may be inappropriate. The inspector requested that the licensee clarify the NCR's content to ensure that each segment was a welded assembly. The item will remain open.

m. (Open) LII (CDR-390/82-29, CDR-391/82-26) Inadequate Duct Supports In the Emergency Gas Treatment System, NCR SWP 8210, WBRD-50-390/82-29, WBRD-50-391/82-26. The licensee's final report was submitted on April 28, 1982, and was found to contain inadequate information. The report was discussed with TVA on September 7, 1982, and it was agreed that TVA would submit supplemental information. NRC received further clarification on September 9, 1982.

The report indicated that duct supports used on the Emergency Gas Treatment System (EGTS) had been found to be inadequate under seismic loading conditions. Air operated valves had replaced dampers but the supports had not been reevaluated due to designer inexperience and failure of the design review process to detect the error.

The inspector asked for additional clarification concerning availability of adequate procedures and evidence of training on February 14, 1982. This item will remain open until that clarification is received.

n. (Open) LII (CDR 390/82-64, CDR-391/82-61) Reactor Coolant Pump Motor Oil Cooler Piping Specification Discrepancies, NCR WBN SWP 8219, WBRD-50-390/82-64, WBRD-50-391/82-61. The report identified that RCP motor coolers and adjacent piping had been supplied by Westinghouse as non-ASME code. This condition deviates from commitments made in the FSAR component classification table which indicated that the coolers and piping were ASME Section III. The report further stated that even

though the cooler and piping were not designed to ASME code, specifications did require full seismic design and, therefore, Regulatory Guide 1.26, Quality Group C requirements had been met.

The content of this report was submitted to NRR for review. The inspector also requested that the licensee identify the reason why the supplied equipment differed from that identified in the FSAR table. This item will remain open.

o. (Open) LII (CDR-390/82-84, CDR-391/82-80) Lack of Qualification For Embedment Plates, NCR WBN CEB 8217, WBRD-50-390/82-84, WBRD-50-391/82-80. The report identified two conditions adverse to quality. Embedment plates had been overloaded and TVA had failed to promptly initiate a nonconformance based on vendor information. ECN 2958, which was subsequently written to handle the nonconformance, was reviewed by the inspector. The ECN indicated that several pipe supports had been modified to correct embedment plate overload. The inspector field verified that pipe support modifications were complete. However, other pipe supports, not referenced in the ECN, were attached to the embedment and may cause overstressing. In discussions with the licensee, the inspector was advised that a previous onsite sampling program had been conducted to determine the overall embedment stress problem; however, it was not known whether the particular embedment in question, Mark #9, had been part of the sample. The inspector requested that the licensee investigate this embedment and all attachments to determine its adequacy before closing the item. Additional review of corrective actions taken with respect to required training on initiating nonconformances will be conducted after further licensee review of the hardware in question. This item will remain open.

8. Licensee Action on Previous Inspection Findings

a. (Closed) Open Item (390/82-18-04) ECN Processing. The concerns raised in this open item were the same as those identified in Construction Deficiency Report (CDR) WBRD-50-390/82-06, WBRD-50-391/82-06. The inspector will review the licensee's corrective actions taken as part of that report; therefore, the open item is closed.

b. (Closed) Open item (390/80-21-07, 391/80-15-03) Safety Classification Control Air. The inspector reviewed the Watts Bar design of the essential air system and its association with non-safety grade air. Cross contamination potential from the non-safety system air to the essential air system was assessed and found to be minimal. Nuclear Power procedures contained adequate precautions to preclude inadvertent contamination during startup and operation of the systems. Discussion with the preoperational test director indicated that testing to date had not revealed any contamination; however, more extensive testing (scheduled but not yet performed) would provide a high confidence level of air system cleanliness. The inspector will review the results of further air system testing. This item is closed.

c. (Closed) Inspector Followup Item (390/80-18-04, 391/80-11-04) Field Instructions Containing Safety-Related Activities. The finding discussed the content of field instructions that were not considered to be under the QA program but possibly contained quality achieving or quality control steps. In response to the finding and to other subsequent NRC enforcement the licensee developed a set of Standard Operating Procedures (SOP) that were to be used for non safety-related activities. The inspector reviewed all of the SOPs and the developed policy statement. The procedures contained no quality assurance activities and the policy statement clearly defined procedural applicability as activities for non safety-related structures, systems, and components. This item is closed.

d. (Closed) Inspector Followup Item (390/81-17-05, 391/81-17-05) Piping Protective Devices Welding Defects. This item was assigned a docket number for tracking purposes. The docket number will be deleted and the deficiency tracked using Construction Deficiency Report (CDR) WBRD-50-390/81-70 and WBRD-50-391/81-66.