



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

Report Nos. 50-390/81-24 and 50-391/81-22

Licensee: Tennessee Valley Authority  
 500A Chestnut Street Tower II  
 Chattanooga, Tennessee 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

Inspector: John W. York  
 J. W. York

November 18, 1981  
 Date Signed

Approved by: B. R. Crowley for  
 A. R. Herdt, Section Chief  
 Engineering Inspection Branch  
 Engineering and Technical Inspection Division

11/18/81  
 Date Signed

SUMMARY

Inspection on October 26-28, 1981

Areas Inspected

This routine, unannounced inspection involved 22 inspector-hours on site in the areas of pipe support baseplate designs using concrete expansion anchor bolts (IE Bulletin 79-02); seismic analysis for as-built safety-related piping systems (IE Bulletin 79-14); and licensee identified items.

Results

Of the three areas inspected, no violations or deviations were identified in two areas; one violation was found in one area (Violation - Failure to Follow Procedure for Hanger Modifications and Disassembly - paragraph 7).

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## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*J. E. Wilkins, Project Manager
- \*R. W. Olson, Construction Engineer
- \*T. B. Bucy, Asst. Construction Engineer
- \*S. Johnson, Asst. Construction Engineer
- \*H. J. Fischer, Asst. Construction Engineer
- \*E. Burke, Asst. Construction Engineer
- \*T. R. Brown, Supervisor, Hanger Engineering Unit
- \*D. W. Kelley, Supervisor, Quality Control Records
- \*T. Hayes, Supervisor, Instrument Unit
- \*S. R. Martin, Engineer, Hanger Engineering Unit
- \*J. W. Coan, Office Engineering Design Construction
- \*T. R. Trail, NRC Response Coordinator

Other licensee employees contacted included construction craftsmen, technicians and office personnel.

#### NRC Resident Inspector

J. A. McDonald  
T. L. Heatherly

\*Attended exit interview

### 2. Exit Interview

The inspection scope and findings were summarized on October 28, 1981 with those persons indicated in paragraph 1 above. The inspector described the areas inspected and discussed the results of the inspection findings listed below. No dissenting comments were received from the licensee.

(Open) Violation 390/81-24-03: "Failure to follow procedure for hanger modifications and disassembly" paragraph 7.

(Closed) Licensee Identified Item 390/81-24-01, 391/81-22-01, "Error in TPIPE Program," TVA CEB 8105, paragraph 5.b.

(Closed) Licensee Identified Item 390/81-24-02, 391/81-22-02, "Unauthorized Cutting of Reinforcing Steel In Diesel Generator Building," TVA NCR 2755R, paragraph 5.c.

3. Licensee Action on Previous Inspection Findings

(Closed) Infraction 390/80-25-02 and 391/80-19-02, "Failure to Follow Procedures." The licensee's letter of response dated October 21, 1980 has been reviewed and determined to be accepted by Region II. The inspector held discussions with the IEB 79-02 Program Manager and examined the corrective actions as stated in the letter of response. The inspectors concluded that TVA had determined the full extent of the subject noncompliance, performed the necessary survey and follow-up actions to correct the present conditions and developed the necessary corrective actions to preclude recurrence of similar circumstances. The corrective actions identified in the letter of response have been implemented.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Licensee Identified Items (50.55(e))(Units 1 and 2)

- a. (Closed) Licensee Identified Item 390/80-12-03, 391/80-09-03, "TPIPE User Failure to Check Frequency Analysis Validity," TVA CEB8004. One function of the TPIPE computer program is to determine the frequency response of piping systems during a seismic event. The TPIPE program outputs information regarding the correctness of the calculation of the frequency analysis. Convergence information is calculated and printed out for each frequency that is analyzed. The TVA personnel who utilized this program failed to check for the nonconvergence message and the correctness of the generalized mass matrix. In a final report to Region II dated April 21, 1980, the licensee stated that all analyses performed using TPIPE have been reviewed. There are no occurrences of erroneous design information resulting from this condition. Additionally, the program has been modified in order to assist the user in detecting a frequency analysis that does not converge. This item is considered closed.
- b. (Closed) Licensee Identified Item 390/81-24-01, 391/81-22-01, "Error in TPIPE Program," TVA CEB8105. The TVA TPIPE computer program was producing erroneous results when running a modal superposition time history analysis on a problem with multiple support excitation and over 60 unique ground motions applied to the structure. Results from TPIPE versions 4.1 through 4.3A were in error. The error could have potentially generated bad design information if not found and corrected. In a letter to Region II dated April 23, 1981 the licensee stated that a new corrected version of the TPIPE program was verified and put into production in place of the version in error. The verification benchmark problems are being reviewed and modified to help locate this type of problem area. Also, all users which were using or had used the erroneous TPIPE versions were polled to determine if any incorrect design information had been issued. The results of this poll showed that no incorrect design data had been issued. This item is considered closed.

- c. (Closed) Licensee Identified Item 390/81-24-02, 391/81-22-02, "Unauthorized Cutting of Reinforcing Steel In Diesel Generator Building," TVA NCR2755R. During the inspection of bolt anchors for cable tray supports and conduit supports in the diesel generator building, it was discovered that rebar had been cut while drilling holes for some bolt anchors. Some holes were drilled into concrete walls and slabs apparently by using carbide-tipped bits which are capable of drilling through reinforcing steel. Other bars were cut using expansion anchor shells. In a final report to Region II dated June 18, 1981, TVA indicated that this deficiency has been evaluated from the results of the field investigation which located the reinforcing bars cut during installation of cable tray and conduit supports. The investigation and analysis were done of worst-case examples, and the analysis indicates that the structural integrity has not been impaired by the cutting of reinforcing bars in question due to the more than sufficient number of reinforcing bars per location. This item is considered closed.
6. (Open) IE Bulletin 79-02: Pipe Support Base Plate Designs Using Concrete Expansion Anchors (Units 1 and 2).

Sampling of Unit 2 concrete expansion anchors to satisfy the requirements of IEB79-02 has not begun. The sampling of anchors for Unit 1 has been completed, however the testing of anchors continues because of the requirements of TVA general specification G32. The following five groups both install and inspect concrete expansion anchors: Electrical Engineering Unit, Hanger Engineering Unit, Mechanical Engineering Unit A, Instrumentation Unit and Civil Engineering Unit. Each of the five groups has its own inspection procedure, however one procedure, QCP1.14 "Inspection and Testing of Bolt Anchors Set In Hardened Concrete" will be used by all the groups upon the completion of its revision. A review will be conducted by the licensee of the five inspection techniques to determine the compatibility of the inspections that have been performed.

The G32 specification requires inspection of concrete anchors before installation of hangers. Since this was not done on a number of hangers, Watts Bar is disassembling approximately 60 hangers or supports per week so that the G32 requirements may be satisfied. An alternate test method for the concrete expansion anchors that would allow inspection of the anchors without hanger or support removal is under consideration by TVA EN DES.

An inspection was performed on the storage area for concrete expansion anchors. Receiving inspection and issuance of the anchors for contract Nos. 80KB4-600603 and RD-441221 were reviewed.

Within the areas inspected no violations or deviations were identified.

7. (Open) IE Bulletin 79-14: Seismic Analysis for As-Built Safety-Related Piping Systems (Units 1 and 2).

The inspection plan for implementing the requirements for IE Bulletin 79-14, "Watts Bar Nuclear Plant Units 1 and 2 Program Plan for IE Bulletin 79-14," dated June 30, 1981 has been issued. However, the formal program for this bulletin has not been started. Initiation of the program is expected after the completion of CEB81-30, "Program Plan-Field Inspection for Determination of As-Constructed Pipe Configuration and Location of Pipe Supports on Rigorously Analyzed Piping Systems." This program (CEB81-30) is developing the as-built drawings that will be utilized for the IEB79-14 program. Targeted completion date for CEB81-30 is January, 1982. Inspection efforts of TVA are being concentrated on Unit 1.

The inspector concentrated inspection efforts on Watts Bar's hanger inspections, since this is a large part of the IEB 79-14 program. The following five hangers on which a finalized quality control inspection had been performed were reinspected:

- a. Hanger No. 62-1LCV-R231 in the Chemical Control and Make Up System
- b. Hanger No. A060-62-19 in the CVCS System
- c. Hanger No. 1-62A-120 in the CVCS System
- d. Hanger No. 1-63-032 in the Safety Injection System
- e. Hanger No. A435-6-31 in the Safety Injection System

The inspector found the following conditions:

- a. Hanger No. 62-1LCV-R23 had been partially disassembled .
- b. Hanger No. A060-62-19 had a bolt missing
- c. Hanger No. 1-62A-120 had two welds that had been excessively ground and therefore did not meet drawing requirements
- d. No problems were encountered on Hanger Nos. 1-63-032 and A435-6-31

Quality Control Procedure 4.23, "Installation Inspection and Documentation Requirements for Seismic Supports," Rev. 2 paragraph 6.64 states that temporary or permanent removal of a documented or partially documented support shall be authorized by a Support Removal-Reinstallation Sheet issued by the Hanger Engineering Unit. No Support Removal Reinstallation sheets had been issued for the three hangers that did not meet drawing requirements. The failure to follow procedure QCP4.23 is in violation of 10 CFR 50

Appendix B, Criterion V as implemented by FSAR Section 17, paragraph 17.1A.5. This violation is identified as item number 390/81-24-03, "Failure to follow procedure for hanger modifications and disassembly."

Within the areas inspected, no violations except as noted in the previous paragraph, or deviations were identified.