



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

Report Nos.: 50-390/84-64 and 50-391/84-44

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 Conducted: August 21-24, 1984

Inspector: *J. R. Harris* *JRH*

9/6/84
Date Signed

Approved by: *T. E. Conlon*
T. E. Conlon, Section Chief
Engineering Branch
Division of Reactor Safety

9/6/84
Date Signed

SUMMARY

Scope: This routine, unannounced inspection involved 22 inspector-hours on site in the areas of coating, structural backfill and civil findings identified in the Black and Veatch report on a review of the auxiliary feedwater system.

Results: No violations or deviations were identified.

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REPORT DETAILS

1. Licensee Employees Contacted

- *G. Wadewitz, Construction Project Manager
- *S. Johnson, Quality Manager
- *C. Christopher, Assistant Quality Manager
- *H. Fisher, Construction Engineer
- J. Cofield, Assistant Quality Manager
- T. Hayes, Nuclear Licensing Supervisor
- B. Bessom, Civil QC Supervisor
- T. Taylor, Civil QC Section Leader
- L. Pauley, Civil QC Inspector
- S. Woodlee, Civil QA Inspector

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on August 24, 1984, with those persons indicated in paragraph 1 above. The licensee acknowledged the inspection findings.

3. Licensee Action on Previous Enforcement Matters

Not inspected.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Independent Inspection

The inspector examined QA/QC controls, completed work and records for protective coatings, in the Unit 1 reactor and auxiliary buildings, and discussed inspection and testing requirements with responsible QC inspectors.

Protective coatings are used on concrete and metal surfaces to facilitate cleanup of radioactive contamination and also for corrosion prevention on metal surfaces.

Acceptance criteria examined by the inspector appear in the following documents:

- a. FSAR Section 3.8.2.6.3, Protective Coatings
- b. Regulatory Guide 1.54, Quality Assurance Requirements for Protective Coatings Applied to Water Cooled Nuclear Power Plants

- c. Specification G-55, Application and Inspection of Special Protective Coatings for Nuclear Plants
- d. Specification G-44, Verification Testing of Paint and Coatings Products
- e. Specification N3A-932, Special Protective Coating Systems Approved for Use in Coating Service Levels I and II and Corrosive Environments
- f. Procedure WBNP-QCP-2.12, Protective Coatings - Inspection and Documentation
- g. Procedure WBNP-QCI-1.02-1, Inspection Rejection Notice
- h. Procedure WBNP-QCI-2.12, Protective Coatings Application Instructions
- i. Procedure WBNP-QCI-2.13, Qualification of Protective Coating Applications

The inspector performed a walkdown inspection of completed coatings in the auxiliary and reactor buildings. The walkdown showed that coating surfaces complied with acceptance criteria.

No peelings, blistering, or cracking of coating surfaces was observed. Some minor damage to coating surfaces of pipe hanger supports and concrete were noted. These were due to ongoing activities and will be repaired when construction activities are completed. Discussions with QC inspectors indicated they were knowledgeable in QA/QC control requirements. The inspectors also demonstrated thickness verification test made with a "Took" gauge and adhesions verification tests made with an "Eclometer".

Records examined by the inspector included the following Nonconformance Reports (NCRs) and Inspection Rejection Notices (IRNs):

NCR 5530	NCR 5443
NCR 5411	IRN C002
NCR 5526	IRN C003
NCR 5084	IRN C004
NCR 5461	IRN C005
NCR 5284	IRN C006
NCR 5360	IRN C007
NCR 5356	IRN C008
NCR 5359	IRN C009

Examination of the above records showed that ongoing problems with coated surfaces were being identified by QC inspectors and repaired as required by acceptance criteria.

Examination of QA/QC controls, completed work and records showed that adequate QA/QC controls are in place for control of coatings, that coatings are being inspected and tested by QA/QC inspectors, and that repair of defective or damaged coatings is an ongoing problem. The problems are being identified by QC inspectors and repaired. Damage to coated surfaces will be an ongoing problem for the life of the plant due to construction or modification activities. Repair work is controlled through work packages.

Within the areas examined no violations or deviations were identified.

6. Foundations Review of Quality Records (46055) Units 1 and 2

The inspector examined quality records for earthfill placed in the Trench B underground barrier for potential liquefaction. Acceptance criteria examined by the inspector are:

Procedure WBNP-PCP-2.01, Earthfill Placement, Inspection, and Documentation

Specification G-9, R5, General Construction Specification for Rolled Earthfill for Dams and Power Plants.

Records examined included earthfill compaction tests (sand cone method) and compaction test curves. Examination of records showed that backfill was placed in accordance with acceptance criteria.

Within the areas examined, no violations or deviations were identified.

7. Examination of Black and Veatch Independent Design Review of Auxiliary Feedwater System - Civil/Structural Area

The purpose of the Black and Veatch (BV) review in the Civil/Structural area was to verify that the appropriate seismic requirements and input from the building response were utilized in the auxiliary feedwater system (AFW) analysis and that appropriate embedment loads were considered. To meet this objective, the review covered the seismic analysis of auxiliary/control building, shield building, and containment vessel. Also, seismic qualification of equipment and design of embedments in concrete. Results of this review resulted in a total of 14 findings in the Civil/Structural area. These are listed in the BV report as finding numbers F-500 through F-513. Two of the findings remain unresolved. These are finding F-508, "Base Plates Designed Using Rigid Analysis Should Use Flexible Analysis" and finding F-511, "Response Spectra used in T Pipe Analysis was not broadened in accordance with requirements in Section 3.7.2.9 of the FSAR." Finding F-508 is being handled by evaluation per OIE Bulletin 79-02 and finding F-511 is being evaluated by the NRR, Mechanical Engineering Branch.

Finding F-503, "Traceability of Input/Output for Floor Response Spectra" and Finding F-504, "5% Eccentricity for Containment not considered as Stated in FSAR" have been assigned to the NRR Structural Engineering Branch for evaluation.

Finding F-513, "Use of Multiple Response Spectra in Piping Analysis not per FSAR Section 3.7.2, was also identified as unresolved item 390/82-27-09 in Region II inspection report numbers 50-390/82-27 and 50-391/82-24. This finding has been assigned to the NRR Mechanical Engineering Branch for evaluation.

The remaining civil/structural findings were considered resolved. These findings are related to seismic design of structures and systems and, hence, should also be examined by the NRR Structural or Mechanical Engineering Branch. The following findings categorized as civil/structural were reviewed.

- a. Finding Number F-502, Containment Analysis used 23 mass points, FSAR states 12 mass points used

The designer of the containment vessel used a 13 mass point model in their dynamic seismic analysis of the containment vessel. This is shown by Section 3.8.2.4 and Figure 3.8.2-9 of the FSAR. TVA Office of Engineering Design Construction (OEDC) used a 23 mass point model in their verification of the vessel designer's work. The 23 mass point model is more conservative and thus is acceptable. TVA has amended the FSAR with Figure 3.8.2-9a to reflect the 23 mass point model used in their verification of the designer's work.

- b. Finding F-506 - Documentation for Closure of NCR WBNCEB 203 Not Complete

Nonconformance report (NCR) WBNCEB 203 addresses the problem of potentially overstressed embedded plates. Finding F-506 was issued to document the fact that the work was not yet completed to close out the NCR. Documentation supporting closure of NCR WBNCEB 203 has been issued. Review of NCR WBNCEB 203 showed that appropriate corrective action and action to prevent recurrence was taken.

- c. Finding F-507 - Insufficient Calculations in EDS Report for Seismic Analysis of Auxiliary Control Building

This finding was issued because sufficient calculations were not provided to verify that the response spectra used in the seismic analysis are correct. Review of this finding showed that calculations were subsequently provided by TVA and that the issue was resolved.

- d. Finding F-509, Model of Internal Concrete Structure Does Not Properly Consider Location of the Shear Center

Details of the seismic model for the interior concrete structures are given in Section 3.7.2.1.1 and Tables 3.7-9 and 3.7-8 of the FSAR. The NRC reviewed and approved the results of the analysis in the issuance of the June 1982 Safety Evaluation Report.

- e. Finding F-510, Lack of Basis for the Frequencies/Mode Shapes Used to Generate Spectra

Review of the TVA response and spectra indicated that the applicable response spectra is acceptable. The response was considered acceptable by Black and Veatch reviewers and the item is considered resolved.