



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

Report Nos. 50-390/80-36 and 50-391/80-28

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

Facility Name: Watts Bar 1 and 2

Docket Nos. 50-390 and 50-391

License Nos. CPPR-90 and CPPR-91

Inspection at Watts Bar Nuclear Plant

Inspectors: J. A. McDonald 7/1/81
 Date Signed

T. L. Heatherly 1/20/81
 Date Signed

Approved by: H. C. Dance 2/20/81
 H. C. Dance, Section Chief, RONS Branch Date Signed

SUMMARY

Inspection on December 1-31, 1980

Areas Inspected

This routine, inspection involved 192 resident inspector-hours on site in the areas of Design Corrective Action, Design Change Control and Independent Inspection.

Results

Of the three areas inspected, no violations or deviations were identified in one area; three violations were found in two areas (Criterion V - Failure to follow NRC procedures; paragraph 5.a.; Criterion XVI - Failure to take appropriate corrective action, paragraph 5.c.; Criterion V - Failure to follow procedures, paragraph 6.a.).

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DETAILS

1. Persons Contacted

Licensee Employees

- *J. E. Wilkins, Project Manager
- *T. R. Brown, Assistant Construction Engineer
- *T. B. Bucy, Hanger Engineering Supervisor
- *C. O. Christopher, Assistant Construction Engineer
- *G. T. Denton, Nuclear Power Operations Supervisor
- *E. R. Ennis, Nuclear Power Assistant Plant Superintendent
- *T. Hayes, Instrumentation Engineering Supervisor
- *L. J. Johnson, Mechanical Engineering Unit "B" Supervisor
- *M. K. Jones, Nuclear Power Preoperational Test Director
- *L. C. Nothard, Assistant Construction Engineer
- *J. A. Nicholls, Project Controls Supervisor
- *R. W. Olson, Construction Engineer
 - A. W. Rogers, Quality Assurance Supervisor
 - J. G. Shields, Assistant Construction Engineer
 - J. A. Thompson, Startup and Test Supervisor
 - D. Wilson, Engineering Design Nuclear Systems Assistant

2. Attended exit interview Exit Interview

The inspection scope and findings were summarized on December 30, 1980 with those persons indicated in Paragraph 1 above. The licensee acknowledged the findings. No commitments for resolution of the unresolved items discussed in the report were made by the licensee. The inspector will make a separate request for such commitments.

3. Licensee Action on Previous Inspection Findings

Not inspected.

4. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve noncompliance or deviations. New unresolved items identified during this inspection are discussed in paragraph 5.b and paragraphs 7.a.b.c.

5. Design Corrective Action

References: (1) Memorandum from Dunham to Fox dated February 23, 1977 (MEB770223076), "Scaling and Corrosion in Power Plant Raw Water Piping - GS-74"

- (2) Memorandum from Patterson to Pierce dated January 4, 1978 (MEB780104021), "Sequoyah Nuclear Plant Units 1 and 2 - Watts Bar Nuclear Plant Units 1 and 2 - Essential Raw Cooling Water (ERCW) System Corrosion/Constriction Study"
- (3) Letter from Gilleland to O'Reilly dated March 31, 1978, "Watts Bar Nuclear Plant Units 1 and 2 - Excessive ERCW System Head Loss - NCR 1003 - Final Report"

During preoperational testing of the Emergency Equipment Cooling Water System at Browns Ferry Nuclear Plant in 1976 inadequate cooling water flow was identified by the licensee and attributed to corrosion product buildup on the interior walls of carbon steel piping. The first of three phases of analytical programs was initiated by reference (1). The inspector reviewed the adequacy of the licensee's design corrective actions to correct this design deficiency as it was applicable to the Watts Bar Nuclear Plant. The findings were unacceptable as follows:

- a. During the process of correction of piping location, four segments of Emergency Raw Cooling Water (ERCW) piping designated ERCW pump prelube were cut out. It was noted by Mechanical Engineering Unit representatives that at least one of these lines was constricted by what appeared to be corrosion products. Though the potential significance of the specific observation to prelube and motor cooling piping was recognized, the condition adverse to quality was not formally identified by Nonconforming Condition Report or other means and no definitive corrective actions were taken or proposed by the responsible engineers. This failure to identify nonconforming conditions constitutes a violation (390/80-36-01, 391/80-28-01).

The ERCW pumping station small bore carbon steel piping both known and suspected to be adversely affected by this condition remained certified as adequately constructed and was formally proposed as ready for tentative transfer and preoperational testing subsequent to the recognition of the condition.

- b. TVA's corrosion/constriction study detailed in reference (2) predicted that numerous subloops cooling safety-related components would become constricted during design lifetime. Until this area is reviewed in depth in subsequent inspections this item is unresolved (390/80-36-02, 391/80-28-02).

- c. Based upon the spring of 1977 knowledge of the severity of this corrosion, an evaluation of its impact on the Emergency Raw Cooling Water (ERCW) system at Sequoyah and Watts Bar was initiated and the results reported in reference (2). This evaluation used the assumption that corrosion buildup would restrict the diameter of the piping by three-fourths inch during design lifetime; hence, piping of three-fourths inch ID or less was assumed to not allow flow. However, the study failed to recommend corrective action and none was taken for the

one-half inch ERCW pump prelube or motor cooling lines. This failure to take appropriate corrective action for this piping constitutes a violation (390/80-36-03, 391/80-28-03).

6. Independent Inspection Effort

Inspection of Unit 1 Containment, the Emergency Core Cooling System pump rooms, and discussion with licensee personnel revealed that procedures were not being followed for nondestructive examinations. The following six welds were observed:

1-68-F-9-65-C1 dated 10/7/80
 1-68-S-2-25-R-1 dated 10/14/80
 1-68-S-2-26 Rev. 1 dated 10/07/80
 1-68-F-9-95-C1 dated 12/11/80
 1-68-S-2-24 dated 12/1/80
 1-68-S-2-17 R1 dated 12/1/80

It was noted that the dye and penetrant used for these examinations had not been thoroughly removed as required by Process Specification 3.M.1.1(c). These examinations occurred subsequent to the licensee's July 25, 1980, response to a similar item of noncompliance (390/80-14-02) which stated corrective actions were complete. This failure to follow prescribed NDE procedures constitutes a violation (390/80-36-04).

It was also noted that sixty-five other welds, examined by the NDE process during the past two years, contained varying degrees of unremoved dye and penetrant. Several tags, identifying the status of these welds with respect to NDE completion, were missing, mutilated or improperly filled out.

7. Design Control Measures

A plant tour and subsequent audit was conducted to assess the licensee's design control measures. Areas inspected were satisfactory with the following exceptions:

- a. Preliminary investigation of Upper Head Injection system 12" flow control valve Field Change Notice (FCN) 10529, Addendum 2 and FCN 10521, Addendum 2 indicated that additional information was required to verify that controls were in place to complete the FCN's as approved. Until the licensee provides the following information/documentation related to FCN's 10529 and 10521 this item is unresolved (390/80-36-05, 391/80-28-04):

1. The cause of damage to the lower wedge assembly on valve 2-FCV-87-22.

2. The work, examination and testing accomplished by Anchor Darling related to FCN's 10529 and 10521.

3. The contract requirements issued by TVA to Anchor Darling for FCN 10529 and 10521 completion.
 4. The source evaluation of Anchor Darling by TVA for the performance of FCN 10529 and 10521.
- b. FSAR Section 9.5.1.3 states that the compartment in which the carbon dioxide storage tank is located in the Diesel Generator Building is designed with a blowout wall to the atmosphere. Any tank rupture or explosion which could result in overpressurization of the room will not disable essential equipment due to missiles or walls collapsing. The carbon dioxide storage compartment does not appear to have a blowout wall. Until the licensee verifies that this blowout wall is installed as designed, this item is unresolved (390/80-36-06, 391/80-28-05).
- c. Clearances between the incore detector thimble guides and their respective alignment hangers have been reduced due to vendor design changes. In some cases there is no clearance which apparently could cause binding of the guides and resultant weld stresses. Clamps used on these guides are required to be installed at specified clearances with respect to adjacent hangers. It does not appear that all clamps are connected at those specified clearances. One of the two support "I" beams beneath the guides has started to bow. Until the licensee evaluates these as-constructed deviations from design specifications, this item is unresolved (390/80-36-07, 391/80-28-06).