



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
230 PEACHTREE STREET, N.W. SUITE 818
ATLANTA, GEORGIA 30303
FEB 25 1977

In Reply Refer To:

IE:II:VLB
50-390/77-1
50-391/77-1

Tennessee Valley Authority
Attn: Mr. Godwin Williams, Jr.
Manager of Power
830 Power Building
Chattanooga, Tennessee 37401

Gentlemen:

This refers to the inspection conducted by Mr. E. J. Vallish of this office on February 2-4, 1977, of activities authorized by NRC Construction Permit Nos. CPPR-91 and CPPR-92 for the Watts Bar Nuclear Plant, Units 1 and 2 facilities, and to the discussion of our findings held with Mr. S. Johnson at the conclusion of the inspection.

Areas examined during the inspection and our findings are discussed in the enclosed inspection report. Within these areas, the inspection consisted of selective examination of procedures and representative records, interviews with personnel, and observations by the inspector.

Within the scope of this inspection, no items of noncompliance were disclosed.

New unresolved items resulted from this inspection and are identified in Section III of the summary of the enclosed report. These items will be examined during subsequent inspections.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC's Public Document Room. If this report contains any information that you believe to be proprietary, it is necessary that you submit a written application to this office requesting that such information be withheld from public disclosure. If no proprietary information is identified, a written statement to that effect should be submitted. If an application is submitted, it must fully identify the bases for which information is claimed to be proprietary. The application should be prepared so that

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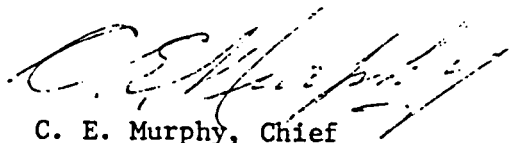
Tennessee Valley Authority

-2-

information sought to be withheld is incorporated in a separate paper and referenced in the application since the application will be placed in the Public Document Room. Your application, or written statement, should be submitted to us within 20 days. If we are not contacted as specified, the enclosed report and this letter may then be placed in the Public Document Room.

Should you have any questions concerning this letter, we will be glad to discuss them with you.

Very truly yours,



C. E. Murphy, Chief
Reactor Construction and
Engineering Support Branch

Enclosure:

IE Inspection Report Nos.
50-390/77-1 and 50-391/77-1

cc: Mr. J. E. Gilleland
Assistant Manager of Power
831 Power Building
Chattanooga, Tennessee 37401

Mr. T. B. Northern, Project Manager
Watts Bar Nuclear Plant
P. O. Box 2000
Spring City, Tennessee 37381



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IE Inspection Report Nos. 50-390/77-1 and 50-391/77-1

Licensee: Tennessee Valley Authority
830 Power Building
Chattanooga, Tennessee 37401

Facility Name: Watts Bar Nuclear Plant, Units 1 and 2
Docket Nos.: 50-390 and 50-391
License Nos.: CPPR-91 and CPPR-92
Category: A2/A2

Location: Spring City, Tennessee

Type of License: W, PWR, 1160 Mwe

Type of Inspection: Routine, Unannounced, Construction

Dates of Inspection: February 2-4, 1977

Dates of Previous Inspection: December 6-10, 1976

Inspector-in-Charge: E. J. Vallish, Mechanical Engineer
Engineering Support Section No. 1
Reactor Construction and Engineering Support Branch

Accompanying Inspector: None

Other Accompanying Personnel: None

Principal Inspector: V. L. Brownlee 2/22/77
V. L. Brownlee Date
Projects Section
Reactor Construction and Engineering
Support Branch

Reviewed by: J. C. Bryant 2/23/77
J. C. Bryant, Chief Date
Projects Section
Reactor Construction and Engineering
Support Branch

SUMMARY OF FINDINGS

I. Enforcement Items

None

II. Licensee Action on Previously Identified Enforcement Items

76-11-A1 (II) Failure to Report

III. New Unresolved Items

77-1/1 Heat Exchanger Anchor Bolts (Units 1)

Insufficient documentation was found at the site to verify that the redesign of the RHR heat exchanger anchor bolts was in compliance with 10 CFR 50, Appendix B, Criterion III. The licensee is investigating this matter in Knoxville. (Details I, paragraph 2)

77-1/2 Reactor Coolant Pump Casing Cleanliness (Units 1 and 2)

The chloride content of the limestone sand found adhering to the surfaces of these pump casings was unknown. The Singleton Laboratory will make this analysis. (Details I, paragraph 3)

IV. Status of Previously Reported Unresolved Items

76-7/2 Status of CB&I Welding Supervisor Qualifications (Units 1 and 2)

76-9/1 Westinghouse Accident Analysis (10 CFR 50.55(e)) (Units 1 and 2)

This matter is closed based on TVA's letter dated October 10, 1976 and NRC's, Reactor Technical Assistance Branch, IE letter dated January 31, 1977.

76-9/2 Breakdown in Vendor QA Program (Bristol Steel and Iron Works - Documentation) (10 CFR 50.55(e)) (Units 1 and 2)

76-10/1 Intake Channel - Unfavorable Gravel Conditions (10 CFR 50.55(e)) (Units 1 and 2)

- 76-10/2 Refueling and Primary Storage Water Tank Piping Tunnels - Seismic Criteria (10 CFR 50.55(e)) (Units 1 and 2)
- 76-10/3 Weld Repair Requirements - Inconsistencies Between Contractural and Procedural Requirements (Units 1 and 2)
- 76-10/4 NSSS Supplied Stainless Steel Piping - Pressurizer Surge Line - (Units 1 and 2)
- 76-11/1 Quality Control Procedure 3.5 - (Units 1 and 2)
- 76-11/2 Quality Control Procedure 1.12 - (Units 1 and 2)
- 76-11/3 IE Circular 76-05, "Hydraulic Shock and Sway Suppressors - Maintenance of Bleed and Lock-Up Velocities on ITT Grinnell Model Nos. - Fig. 200 and Fig. 201, Catalog PH-74-R" (Units 1 and 2)
- 76-11/4 Modification - General Warning Alarm System in the Solid State Protection System (Units 1 and 2)
- 76-11/5 Nonconformance Report No. 554, "Relays - Shutdown Board Logic Panels" and Condition Adverse to Quality Report No. E3, "Two Position Selector Switch Operator - Square D Company 9001-DS11FB" (Units 1 and 2)
- 76-12/1 Lifting Equipment Load Testing (Unit 1)

V. Design Changes

None

VI. Unusual Occurrences

None

VII. Other Significant Findings

A. Project Status

Unit 1

Physical construction is estimated to be 57% complete. The ninth ring was being welded on the containment shell and the circular equipment hatch was being welded into the penetration. The four steam generators are stored in place and the reactor vessel is set in final position. The hot legs are in place and preparations are being made to PT the weld preps for fit up to the reactor vessel nozzles. Liner plates are being welded into the fuel handling pool.

Unit 2

Physical construction is estimated to be 49% complete. The fifth ring of the containment shell was being erected and installation of rebar in the crane support wall and reactor vessel cavity walls continues.

B. Personnel Changes

J. C. Killian has been transferred to the Knoxville Office of Construction. T. B. Northern is now Project Manager with H. C. Richardson as Project Engineer.

VIII. Management Interview

The exit interview was held on February 4, 1977 with S. Johnson, Assistant Construction Engineer, members of his staff, and QA representatives of EN DES, CONST and OEDC. They were apprised of the findings of this inspection as noted in this report.

DETAILS I

Prepared by:

E. J. Vallish

E. J. Vallish, Mechanical Engineer
Engineering Support Section No. 1
Reactor Construction and Engineering
Support Branch

2-17-77

Date

Dates of Inspection: February 2-4, 1977

Reviewed by:

T. E. Conlon

T. E. Conlon, Chief
Engineering Support Section No. 1
Reactor Construction and Engineering
Support Branch

2/17/77
Date

1. Persons Contacted

Tennessee Valley Authority (TVA)

H. C. Richardson - Project Engineer
W. D. DeFord - Supervisor, EN DES
J. M. Lamb - Supervisor, Mechanical Engineering
S. Johnson - Assistant Construction Engineer
J. D. Shanlever - Mechanical Engineer
L. D. Bates - Mechanical Engineer
T. R. Brown - Civil Engineer
J. H. Chattin - Mechanical Engineer

2. Heat Exchanger Anchor Bolts - Unit 1 (77-1/1)

The floor slab was drilled to set anchor bolts for the containment spray and the residual heat removal (RHR) heat exchangers, in accordance with drawing 85S 48N 1231R1 titled, "Miscellaneous Steel Tank & Equipment Supports." FCR-0253 changed the length of the RHR anchor bolts shown on that drawing, so that they would not penetrate the lower mat of rebar in that slab. Design acknowledged that cutting the upper mat rebar for the anchor bolts would be acceptable, but cutting the lower mat bars could weaken the slab. If the length of the anchor bolts were designed to include seismic criteria without consideration for the lower mat of rebar, then perhaps the shortening of the anchor bolts to consider the rebar, omitted consideration of the seismic or other requirements. Documentation could not be found at the site to support design control for cutting the upper mat rebar and treatment of seismic criteria. The licensee acknowledged this item and advised that the Knoxville office would have this type of documentation. This item is open.

3. Reactor Coolant Pump Casing Cleanliness-Units 1 and 2 (77-1/2)

The reactor coolant pump casings were observed to have limestone sand adhering to the surfaces, and on one casing, on the bottom weld prep. The licensee explained that the unloading procedure for these pumps required the use of sand as a "pillow" during the upending operation, and the sand adhered to the contacted surfaces. The sand had not been analyzed for chlorides which could be detrimental to the casing material under certain conditions. The licensee stated he would have the sand analyzed and use the results as a basis for further action. This item is open.

4. Containment Steel Structure and Supports - Observation of Work - Unit 1

a. Reactor Vessel Supports

The reactor vessel supports were inspected in detail and found to be in their final configuration pending final dimensional checks to be performed during hot functional testing. The following documents were reviewed and used to verify locations, orientation details and installation requirements: - TVA drawing 48N410 titled, "Reactor Supports;" Westinghouse Electric Company's drawing 113E335 titled, "Reactor Vessel Support Hardware Details;" Procedure WAT-RVS-1 titled, "Watts Bar Reactor Vessel Setting Procedure;" and Instruction WBFI M-11 titled, "Watts Bar Nuclear Plant Field Instructions - Installation of Nuclear Steam Supply System Major Components." By means of interviews with the responsible inspectors for QA/QC activities, it was determined that they were well versed in the requirements and knowledgeable in the skills required to adequately perform their responsibilities.

b. Steam Generator Supports

The steam generator supports were inspected in detail and found to be in place and supporting the generators but requiring final setting after the hot leg from the reactor vessel is fit-up. The upper and lower steam generator supports were at their approximate final locations around the vessels, but did not have snubbers or the final shims in place.

The following documents were reviewed and used to verify locations, orientation details and installation requirements: TVA drawings S48N411 titled, "Structural Steel - Equipment Support - S.G.&R.C. Pump Vertical Column Location;" 48N412 titled, "S.G.&R.C. Pump Vertical Columns;" 48N413 titled, "Lower Steam Generator and Pump Tie Rod Supports and Arrangements;" 48N414 titled, "Lower Steam Generator Support;" 48N416 titled, "Upper Steam Generator Support and Arrangement;" and 48N417 titled, "Upper Steam Generator Support." The same inspection personnel were performing QA/QC activities for the steam generator supports as described above for the reactor vessel supports.

5. Containment Steel Structures and Supports - Quality Records Review-Unit 1

By review of the following quality records it was ascertained that these records were in accordance with established procedures and did reflect work accomplishment in accordance with the applicable requirements in the areas of installation and QC inspection.

a. Reactor Vessel Supports

Equipment Installation Operations Sheet MIQP No. 1-68-F-1-13 recorded the step operations and inspections during installations of the vessel supports thru equipment release, leveling, establishing proper clearance, surface contact adjustment, lubrication, shimming and final mensurational checks.

b. Steam Generator Supports

Installation and inspection of the steam generator supports were recorded on Equipment Installation Operations Sheets MIQP No's. 1-68-F-1-14, -15, -16 and -17 for NSSS Loops 1, 2, 3 and 4, respectively. The identification numbers on the support columns of Loop 1 and Loop 4 were transcribed from the columns in the field and a record audit was performed to validate quality requirements. Loop 1 columns were recorded as MK 3-2P-1-2, MK 3-2S-1-4, MK 3-2S-1-9 and MK 3-2S-1-3. Loop 4 columns were recorded as MK 3-2S-1-12, MK3-2S-1-11, MK 3-2S-1-2 and MK 3-2S-1-13. Quality records for those columns were retrieved and reviewed. These records certified materials, welder qualification, visual inspections, dimensional accuracy and nondestructive examination reports. Similar certifications were also reviewed for the upper and lower steam generator supports.

6. Independent Inspection Effort - Unit 1

This inspection effort consisted of visual inspection of work being performed on the essential raw cooling water system in a portion of the Auxiliary Building. The following documents were reviewed and used to verify locations, orientation details and installation requirements: TVA drawings 85M47W 450-3, -4 and -6 titled, "Mechanical - Essential Raw Cooling Water;" 85M47W450-208 titled, "System N3-67-6A Isometric-Seismic, Static and Thermal Analysis of ERCW Piping;" 85M47W464-3 titled, "Mechanical Component Cooling System;" and 85S48N1231 titled, "Miscellaneous Steel Tank and Equipment Supports." Installation of piping is underway and the bases for major components are being laid out. One unresolved item resulted from this portion of the inspection and it is documented in paragraph 2 of these Details as new unresolved item 77-1/1.

7. Findings

Within the areas examined there were no items of noncompliance indicated and with the exception of the two new unresolved items documented in paragraphs 2 and 3 of these Details, all findings were clear.