



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

JAN 4 1977

In Reply Refer To:
IE:II:VLB
50-390/76-12
50-391/76-12

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. V. L. Brownlee of this office on December 6-10, 1976, 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. J. C. Killian 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.

We have examined actions you have taken with regard to previously identified enforcement matters. These are identified in Section II of the summary of the enclosed report.

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 on 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

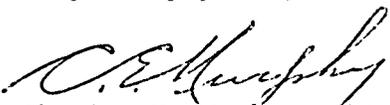
Tennessee Valley Authority

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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,


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

Enclosure:

IE Inspection Report Nos.
50-390/76-12 and 50-391/76-12

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

Mr. J. C. Killian, Project Manager
Watts Bar Nuclear Plant
P. O. Box 2000
Spring City, Tennessee 37381



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

IE Inspection Report Nos. 50-390/76-12 and 50-391/76-12

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: December 6-10, 1976

Dates of Previous Inspection: November 16-19, 1976

Principal Inspector: V. L. Brownlee, Reactor Inspector
Projects Section
Reactor Construction and Engineering Support Branch

Accompanying Inspector: R. M. Compton, Reactor Inspector
Engineering Support Section No. 1
Reactor Construction and Engineering Support Branch

Other Accompanying Personnel: J. C. Bryant, Chief
Projects Section
Reactor Construction and Engineering
Support Branch

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

Principal Inspector: V. L. Brownlee

V. L. Brownlee, Reactor Inspector
Projects Section
Reactor Construction and Engineering
Support Branch

12/28/76
Date

J. C. Bryant
J. C. Bryant, Chief
Projects Section
Reactor Construction and Engineering
Support Branch

1/3/77
Date

SUMMARY OF FINDINGS

I. Enforcement Items

None

II. Licensee Action on Previously Identified Enforcement Items

76-11-A1 (II) Failure to Report

Details I, paragraph 3.

III. New Unresolved Items

76-12/1 Lifting Equipment Load Testing

Items of concern noted by TVA Engineer during final acceptance testing of NSSS major component lifting equipment were documented in the test report but the resolutions to these items of concern were not documented. The licensee will review this matter and take action as needed. (Details II, paragraph 2)

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)

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
- 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)

V. Design Changes

None

VI. Unusual Occurrences

None

VII. Other Significant Findings

None

VIII. Management Interview

The exit interview was held on December 10, 1976, with Mr. J. C. Killian, Project Manager, 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:

V. L. Brownlee
V. L. Brownlee, Reactor Inspector
Projects Section
Reactor Construction and Engineering
Support Branch

12/28/76
Date

Dates of Inspection: December 6-10, 1976

Reviewed by:

J. C. Bryant
J. C. Bryant, Chief
Projects Section
Reactor Construction and Engineering
Support Branch

12/30/76
Date

All information in Details I applies equally to Units 1 and 2 except where identified with a specific reactor.

1. Individuals Contacted

Tennessee Valley Authority (TVA)

Watts Bar Site

J. C. Killian - Project Manager
T. B. Northern, Jr. - Construction Engineer
A. R. White - Construction Superintendent
S. Johnson - Assistant Construction Engineer - Mechanical
J. S. Colley - QA Engineer, EN DES
A. W. Rogers - QA Supervisor, CONST
J. H. Perdue - Electrical Engineering Unit Supervisor
R. L. Heatherly - QC and Records Engineering Unit Supervisor
T. Hayes - Instrumentation Engineering Unit Supervisor
R. D. Anderson - Electrical Engineer
J. M. Lamb - Mechanical Engineering Unit Supervisor
L. J. Johnson - Mechanical Engineer
J. D. Shanlever - Mechanical Engineer
J. E. Treadway - Assistant General Construction Superintendent
K. T. Christman - Safety Engineer

2. Project Status

General

Overall construction is estimated to be 51% complete. Overall concrete placement for project is estimated to be 90% complete.

Earth excavation for the intake channel is estimated to be 85% complete. Backfilling with earth and crushed stone in the channel continues except for the areas where unfavorable shale or gravel conditions were encountered at elevation 665. Total site personnel number approximately 3,100.

Unit 1

Construction is estimated to be 56% complete. Containment erection is at the eighth ring. The reactor vessel has been set. Steam generators and other large NSSS components are scheduled to be set during January, 1977.

Unit 2

Construction is estimated to be 48% complete. Reactor building crane wall and refueling canal work continues.

3. Licensee Action on Previously Identified

Enforcement Items

76-11-A1(II) Failure to Report (Units 1 and 2)

The inspector held lengthy discussions with EN DES QA and CONST personnel relative to programmatic changes in progress to resolve this matter. TVA CONST issued WBNP-QCP 1.2, Rev. 2, "Control of Nonconforming Items," and WBNP-QCP 1.4, "Conditions Adverse to Quality and Corrective Action," Rev. 1, on December 9, 1976.

Discussions with the responsible engineers and review of the revised procedures and related forms indicate, with reasonable assurance, that onsite deficiencies and conditions adverse to quality will be interfaced with the EN DES program for evaluation for reportability to NRC.

Additionally, the insepctor reviewed draft copies of EN DES-QAP 1.5, Rev. 3, "Reporting and Handling of Nonconformances In EN DES," and EN DES-QAP 1.10, Rev. 0, "Determining and Reporting NRC-OIE Reportable Conditions." The inspector informed the EN DES QA Engineer that these procedures, their implementation,

and other TVA divisional interface activities would be examined during a subsequent inspection.

4. Fire Test

On December 7, 1976, the inspector witnessed a fire test of completed electrical fire stop penetrations. The test is to provide comparative test data on the effectiveness of different fire barrier materials and coating materials applied to exposed surfaces of cables. A full scale horizontal mockup was constructed using eight cable trays. The mockup consisted of two identical rows of trays (four each) with installed cables and sealant material comparable to a typical Watts Bar arrangement of cable fire stop penetrations. Cable coating materials were applied to the exposed surfaces of cables for a 5-foot distance from the fire barrier.

One note of interest is that when the cables ignited there was a continual burn from point of ignition through the 5-foot surface covered area. The fire stopped at the fire barrier. All consumables outside the barrier burned.

5. Independent Inspection Effort

The inspector observed work in the following areas: Intake channel excavation and backfill; general status of construction; cable tray and support installations; equipment storage including in-place storage, warehousing and laydown yards; preparations for setting of major NSSS components (see Details II of this report for more specifics); and witnessing of electrical penetration fire test. No items of noncompliance were identified in the areas observed.

DETAILS II

Prepared by:

R. M. Compton
R. M. Compton, Reactor Inspector
Engineering Support Section No. 1
Reactor Construction and Engineering
Support Branch

12/29/76
Date

Dates of Inspection: December 6-10, 1976

Reviewed by:

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

1/3/76
Date

All information in Details II applies to Unit 1.

1. Persons Contacted

Tennessee Valley Authority (TVA)

- J. Lamb - Mechanical Engineering Unit Supervisor
- J. Shanlever - Field Engineer, Mechanical
- L. Bates - Field Engineer, Mechanical
- H. Grimac - Field Engineer, Mechanical
- A. Rogers - Field QA Supervisor
- K. Christman - Safety Supervisor
- T. Aaron - Iron Workers Superintendent
- A. Dexter - Rigger Supervisor

2. Scope of Inspection

This inspection was conducted to ascertain if reactor vessel (RV) installation activities are being performed in accordance with applicable drawings, specifications, QC procedures and NRC requirements. The inspection consisted of a review of requirements and commitments, observation of completed work and work in progress, interviews with licensee personnel and a review of pertinent quality related records.

3. Reactor Vessel Installation - Observation of Work Activities

The following listed QA/QC procedures, installation procedures and drawings governing RV installation were reviewed:

- a. TVA QA Manual, Section 1.5, "Manufacturer's and Installer's Responsibilities"

- b. TVA QA Manual, Section 4.1, "Manufacturing and Installation Quality Plan"
- c. TVA Quality Control Procedure 1.18, "Lifting and Transporting of Major Components"
- d. TVA Hazard Control Manual, Section 525, "Rigging Equipment"
- e. Field Instruction WBFI-M11, "Installation of Nuclear Steam Supply System Components"
- f. Manufacturing and Installation Quality Plan (MIQP) 1-68-F-1, "Reactor Coolant System Major Component and Support Installation"
- g. TVA Dwg. 108K10312, Reactor Vessel Installation Procedure
- h. TVA Dwg. 108K10304, Unit 1 NSSS Installation - General Arrangement
- i. TVA Dwg 108K10309, 400 Ton Crane and Runway Tests

The inspector witnessed the lifting of the RV from ground level to an upending device on the runway into the containment and the upending of the RV above the RV cavity in the containment. The inspector also witnessed the preparation of the RV supports in the RV cavity (cleaning and preservation of supports and elevation setting of the leveling screws). Discussions with the responsible mechanical engineers, who perform field engineering and QC activities for this work, the rigging supervisor, the iron worker superintendent and the safety supervisor indicated that the involved personnel were aware of and complying with the requirements of applicable procedures and drawings. Zeiss level, serial No. 78302, was used to establish leveling screw elevations and had been calibrated on November 24, 1976.

The inspector reviewed various in process and completed quality related records including the following:

- a. Lift and transport master checklists which provide signoffs documenting the applicable procedures and drawings, description and identification of lifting/handling equipment, names of involved personnel, verification that prerequisites have been accomplished, etc, for each Class A lift or transport.

- b. MIQP Operations Sheet 1-68-F-1-13 which provides a sequential outline of the installation operations to be performed and provides space for responsible party signoff of steps requiring verification.
- c. Load test documentation for the ringer crane, the construction polar crane and the runway.

Within the areas examined, there were no items of noncompliance identified.

4. Lifting Equipment Load Testing

A memo to file dated November 10, 1976, documented the satisfactory load testing of the construction polar crane and runway for the Unit 1 Reactor Building. In reviewing the memo it was noted that several conditions were observed during the test by the responsible engineer that apparently were not serious enough to invalidate the test, but were serious enough to specify in the memo that they should be resolved prior to setting of the RV. However, there was no further documentation or reference to documentation of the final resolution of these reported conditions. Discussions with the engineers responsible for RV installation indicated that the conditions noted on the final load test documentation memo had been satisfactorily resolved prior to commencement of the Unit 1 RV installation. However, considering the load tests and Class A lifts remaining to be accomplished on Units 1 and 2, this lack of a documented resolution to engineer concerns was discussed with the licensee as an unresolved item. The licensee agreed to evaluate this oversight and make the necessary corrections.