



UNITED STATES
ATOMIC ENERGY COMMISSION
DIRECTORATE OF REGULATORY OPERATIONS
REGION II - SUITE 818
230 PEACHTREE STREET, NORTHWEST
ATLANTA, GEORGIA 30303

TELEPHONE: (404) 826-4503

In Reply Refer To:

NOV 19 1974

RO:II:VLB
50-390/74-5
50-391/74-5

Tennessee Valley Authority
ATTN: Mr. J. E. Watson
Manager of Power
818 Power Building
Chattanooga, Tennessee 37401

Gentlemen:

This refers to the inspection conducted by Messrs. V. L. Brownlee, L. E. Foster, R. W. Wright, W. D. Kelley, and J. C. Bryant of this office on October 8-9 and October 23-25, 1974, of activities authorized by AEC 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 by Mr. Brownlee and Foster with Messrs. J. C. Killian and G. F. Dilworth 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 violations were disclosed.

We have examined actions you have taken with regard to previously reported unresolved items. These are identified in Section IV of the summary of the enclosed report.

In accordance with Section 2.790 of the AEC'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 AEC'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

NOV 19 1974

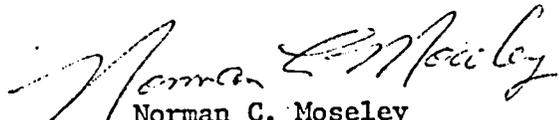
Tennessee Valley Authority

-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,


Norman C. Moseley
Director

Enclosure:
RO Inspection Report Nos.
50-390/74-5 and 50-391/74-5

Letter to Tennessee Valley Authority from N. C. Moseley
dated NOV 19 1974 and RO Rpt. Nos. 50-390/74-5
and 50-391/74-5

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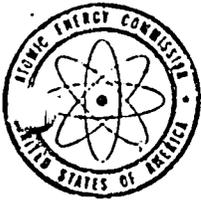
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LB



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REGION II - SUITE 818
230 PEACHTREE STREET, NORTHWEST
ATLANTA, GEORGIA 30303

TELEPHONE: (404) 526-4503

RO Inspection Report Nos. 50-390/74-5 and 50-391/74-5

Licensee: Tennessee Valley Authority
818 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, Announced (October 8-9, 1974)
Routine, Unannounced (October 23-25, 1974)

Dates of Inspection: October 8-9, 1974
October 23-25, 1974

Dates of Previous Inspection: July 31 - August 2, 1974

Inspectors-in-Charge: L. E. Foster, Reactor Inspector (October 8-9, 1974)
Facilities Section
Facilities Construction Branch

V. L. Brownlee, Reactor Inspector (October 23-25, 1974)
Facilities Section
Facilities Construction Branch

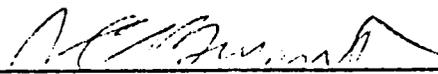
Accompanying Inspectors: W. D. Kelley, Reactor Inspector (October 8-9, 1974)
Engineering Section
Facilities Construction Branch

R. W. Wright, Reactor Inspector (October 23-25, 1974)
Engineering Section
Facilities Construction Branch

Other Accompanying Personnel: J. C. Bryant, Senior Inspector (October 25, 1974)
Facilities Section
Facilities Construction Branch

Principal Inspector: V. L. Brownlee
V. L. Brownlee, Reactor Inspector
Facilities Section
Facilities Construction Branch

11/15/74
Date

Reviewed By: 
J. C. Bryant, Senior Inspector
Facilities Section
Facilities Construction Branch

11/15/74
Date

SUMMARY OF FINDINGS

I. Enforcement Action

A. Violations

None

B. Safety Items

None

II. Licensee Action on Previously Identified Enforcement Matters

A. Violations

None

B. Safety Items

None

III. New Unresolved Items

74-5/1 Valve Wall Thickness Verification Program

TVA (DED) will submit a valve wall thickness program that meets Region II letters of June 30, 1972 and February 16, 1973. (Details II, paragraph 2)

IV. Status of Previously Reported Unresolved Items

74-4/1 Malfunction of Safety Related Switches (RO Bulletin 74-6)

TVA submitted letters of response dated July 3 and September 18, 1974, identifying their proposed corrective actions and plans. Region II will confirm implementation during subsequent inspections. This item remains open. (Details II, paragraph 5)

V. Design Changes

None

VI. Unusual Occurrences

None

VII. Other Significant Findings

The strike at the containment vessel contractor's (CB&I) Birmingham plant has been settled. CB&I is expected to be on-site and to start base liner assembly during the week of November 4, 1974.

A. Project Status

Overall construction is 15% complete. Major reactor loop mechanical components and pipe are scheduled to arrive on-site during the period November 1974 - February 1975.

B. Personnel

No change from RO Report 50-390, 391/74-4.

C. Training

Training is continuing as previously identified in RO Report 50-390, 391/74-4.

VIII. Management Interview

Inspection of October 8-9, 1974 - The inspectors met with G. F. Dilworth, Head Mechanical Engineer, DED Knoxville. The inspector was informed that a valve wall thickness verification program would be submitted to Region II.

Inspection of October 23-25, 1974 - The inspectors met with J. C. Killian, Project Manager, DEC, and R. D. Bradley, DED QA Staff, Knoxville. The inspectors informed the licensee of the turnover of RO principal inspector responsibilities. The licensee was apprised of the areas inspected and findings relative to the QA/QC program and its implementation for concreting operations (containment) and the development and implementation of the QA/QC program for containment vessel erection by CB&I. No violations were identified. One new unresolved item was identified concerning the valve wall thickness verification program.

DETAILS I

Prepared by: R. W. Wright, Jr.
R. W. Wright, Jr., Reactor Inspector
Engineering Section
Facilities Construction Branch

11/7/74
Date

Dates of Inspection: October 23-25, 1974

Reviewed by: L. L. Beratan
L. L. Beratan, Senior Inspector
Engineering Section
Facilities Construction Branch

11-7-74
Date

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

1. Persons Contacted

Tennessee Valley Authority (TVA)

J. C. Killian - Project Manager
T. B. Northern - Construction Engineer
H. S. Sheppard - Unit Supervisor, Civil Field Engineering Unit
J. C. Cofield - Unit Supervisor, Materials Engineering Unit
R. L. Heatherly - Unit Supervisor, Quality Control and Record Unit
C. E. Thompson - Civil Engineer, Field Quality Assurance Engineer
J. E. Daniel - Civil Engineer, Structural and Reinforcement Steel
Section of Civil Engineering Unit

2. Scope of Inspection

This inspection was conducted to familiarize the inspector with TVA's Watts Bar Nuclear Plant, its QA/QC site personnel, mode of operation, and to inspect the implementation of the licensee's QA/QC program as it pertains to containment concrete.

3. Containment Concrete

a. QC System Review

The licensee is using TVA's General Construction Specification No. G-2, "Plain and Reinforced Concrete" and Quality Control Procedure 2.2 entitled, "Concrete Placement and Documentation," as their working criteria for concrete quality control. The above general specification

and procedure were reviewed by this inspector; however, the QC procedure was examined in more detail since it was more specific and tailored to the Watts Bar Site.

b. Observation of Concrete Work Performance

The inspector observed the preparation for pour CB D10, a 309 CY control building roof slab pour. This pour utilized 28-day strength, 3000 psi concrete, and 1-1/2" maximum size aggregate. The exposed adjacent vertical faces of previous concrete pours along with the deck form work were being washed down for cleanup and wetting of forms prior to the concrete placement. The concrete pour card was examined and found in order. The placement crew appeared adequate having four available vibrators to consolidate the concrete. No deficiencies were noted in forming, installation of reinforcements and embedments, placement of concrete or in the control of those operations. Although its application was not witnessed, curing of the slab was to be accomplished with a liquid membrane-forming curing compound which will be further covered with plastic sheeting or waterproof paper.

This inspector observed the testing of a batched mix for temperature, slump, air content and density. Compressive strength test cylinders were compacted by TVA's designed compaction table method which has been found to provide greater accuracy and less variation than rodded cylinders molded in accordance with ASTM C31.

An inspection was made of the facilities and operations of the concrete batch plant and of components handling and storage. No discrepancies were observed in these areas.

c. Concrete Record Review

The following concrete placements were selected for review of procurement storage, receiving inspection, concrete delivery, placement, testing, curing and strength testing:

Reactor Building No. 1, Containment Base Mat, Pour A17 combined with A6B, A5, and A16, Mix 501.5 BFW, Drwg. 41N10060-1, El. 690 to 694.5, 444 CY placed May 16, 1974.

Reactor Building No. 2, Containment Base Mat, Pour A1, Mix 301.5 AFW, Drwg 41N10060-11 R1, El 664 to 671.69, 668 CY placed April 15, 1974.

No discrepancies were identified in the implementation or documentation of records for the above pours inspected. Concrete pour cards, vendor mill certificates (cement) and independent user tests, aggregate sieve analyses, water tests and compressive test cylinder records were examined and found to be acceptable in accordance with

QCP 2.2. The structural drawings for each pour were examined for design strengths required and found to comply with the mix placed. Crew size, equipment and technique for the above placements as far as discernable were adequate.

d. Random Record Review

The frequency and results of concrete test cylinders, measurements for temperature, air content, slump, and charts depicting moving averages of five consecutive tests of slump and 3-day compressive strengths were reviewed.

Batch plant mix weights were compared with approved concrete mix designs for conformance to specified weight tolerances as permitted by ASTM C-94 for cement, aggregate, water, and admixtures.

The status of laboratory testing equipment calibration and batch plant scale calibration was checked.

Three heats of reinforcing steel VB 3202, VB 3200, and VB 3175 were selected from the storage area and traced for proper receiving and inspection records, and vendor mill test reports in compliance to ASTM A615 for adequate frequency and strength testing. No cadwelding has been performed to date, however, procedures are available when applicable.

No violations were found for the above items inspected.

4. Concrete Quality Assurance Audits

The licensee's QA team has conducted three concrete audits which were performed on the following dates:

October 30, 1973
June 12, 1974
March 14, 1974

This inspector reviewed the findings, recommendations and responses and has no questions on the audits.

DETAILS II

Prepared By:

W. D. Kelley
W. D. Kelley, Reactor Inspector
Engineering Section
Facilities Construction Branch

11/18/74
Date

L. E. Foster
L. E. Foster, Reactor Inspector
Facilities Section
Facilities Construction Branch

11/18/74
Date

Dates of Inspection: October 8-9, 1974

Reviewed By:

L. L. Beratan
L. L. Beratan, Senior Inspector
Engineering Section
Facilities Construction Branch

11-18-74
Date

These details apply to both Units 1 and 2.

1. Persons Contacted

Tennessee Valley Authority (TVA)

M. N. Bressler - Nuclear Engineer
J. M. Weinbrenner - Metallurgical Engineer

2. Valve Wall Thickness Verification Program

The requirements for valve wall thickness verification specified in Region II letters of June 30, 1972 and February 16, 1973, were discussed with TVA (DED). A handwritten draft of a proposed valve wall thickness program was presented to the inspector. TVA (DED) was informed in a telephone conversation subsequent to the inspection that their proposed program did not meet all the requirements of pertinent Region II letters.

TVA will revise their program and submit it to Region II for their review. This is a new unresolved item.

DETAILS III

Prepared By: V. L. Brownlee
V. L. Brownlee, Reactor Inspector
Facilities Section
Facilities Construction Branch

11/11/74
Date

Dates of Inspection: October 23-25, 1974

Reviewed By: J. C. Bryant
J. C. Bryant, Senior Inspector
Facilities Section
Facilities Construction Branch

11/15/74
Date

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

1. Individuals Contacted

Tennessee Valley Authority (TVA)

J. C. Killian - Project Manager
T. B. Northern - Construction Engineer
J. M. Lamb - Mechanical Engineering Unit Supervisor
L. J. Johnson - Mechanical Engineer
J. R. Inger - QA Engineer - Mechanical
J. A. Morgan - Welding Engineer
S. Johnson - Principal Mechanical Engineer
R. L. Heatherly - QC and Records Supervisor
A. R. White - General Construction Superintendent

2. Scope of Inspection

This inspection was conducted to familiarize the inspector with TVA's Watts Bar Nuclear Plant; its construction and QA/QC site organizational/functional alignment; effect turnover of the principal inspector responsibilities from Foster to Brownlee; and to evaluate the development and implementation of the QA plan for erection of the reactor building steel containment vessel by CB&I.

3. Reactor Building Steel Containment Vessels

a. General

TVA contract 73C61-75320 and TVA specification 1440, "Structural Steel Containment Vessels for the Reactor Buildings at Watts Bar Nuclear Plant Units 1 and 2," control this area of work.

The steel containment vessel consists of side walls measuring approximately 113 feet from the liner and the base mat to the spring line of the dome and has an inside diameter of approximately 115 feet. The design, fabrication, inspection, and testing of the steel containment vessel above the bottom liner plate will comply with the requirements of the ASME Code, Section III, Subsection NE, Class MC Components. The vessel will not be code stamped. Specific QC requirements for fabrication, inspection and testing are identified in Chapter 5 of the SAR.

CBI has been contracted to provide the structural steel for the two containment vessels and their penetrations, attachments, and appurtenant parts. The work covered by the contract and specification comprises design, furnishing, fabricating, shop painting, delivering, unloading, field assembling, installing and erecting, inspecting and testing in accordance with the TVA contract, specification and TVA preliminary drawings. CB&I is presently scheduled to arrive on-site to start base liner assembly during the week of November 4, 1974.

b. Quality Assurance Plan

TVA imposes via the contract and specification, that CB&I establish and maintain a system for control of quality during manufacture, erection, and examination which assures that all products, components, assemblies and services conform to the requirements of QA control as specified in Article NA-4000 of the ASME Boiler and Pressure Vessel Code Section III 1971 edition, and latest addenda. Additionally, TVA imposes the requirements of Appendix E to the specification, "TVA Quality Assurance Program of Manufacturers and Suppliers of Material and Equipment."

CB&I will perform on-site construction and QC activities in accordance with the, "CB&I Nuclear Quality Assurance Manual for ASME Class 1, 2, 3 and MC Products, Division 4, Construction." The CB&I QA program has been reviewed by TVA Knoxville and differences have been resolved. Responsibility for on-site construction and QC surveillance of CB&I is assigned to the TVA Mechanical Engineering Unit. The on-site TVA Field Quality Assurance Unit has the responsibility for performing QA audit functions to assure implementation of the TVA Mechanical Engineering Unit surveillance program and the CB&I construction QA program.

Discussions with TVA on-site construction, quality surveillance, and QA personnel; review of the TVA contract, specification, preliminary surveillance procedures; and the review of the CB&I QA Manual confirmed that TVA is in the process of implementing an on-site

QA program that is consistent with the SAR requirements. TVA's on-site quality surveillance and audit programs are not yet finalized; however, considering the status of on-site work and CB&I's arrival dates, TVA's surveillance and audit programs appear to be at a reasonable stage of development and implementation. This matter will be further examined during subsequent site visits.

4. Receipt of Major Mechanical Components

The following list identifies scheduled receipt of major mechanical components:

Reactor Vessel	11/74
Reactor Vessel Internals	11/74
Steam Generators 1	11/74
2	12/74
3	11/74
4	12/74
Reactor Coolant Pipe	12/74
Pressurizer	1/75

Reactor Coolant Pumps -	<u>Cases</u>	<u>Internals</u>	<u>Motors</u>
1	10/74	11/74	8/75
2	10/74	11/74	8/75
3	11/74	11/74	11/74
4	11/74	12/74	11/75

5. Malfunction of Safety Related Switches (RO Bulletin 74-6)

TVA submitted letters of response dated July 3 and September 18, 1974, identifying their proposed corrective actions and plans. Region II has evaluated the proposals and will confirm implementation during subsequent inspections.