

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

TELEPHONE: (404) 526-4503

In Reply Refer To:
RO:II:LEF
50-390/74-4
50-391/74-4

AUG 23 1974

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. L. E. Foster and W. B. Swan of this office on July 29 - August 2, 1974, of activities authorized by AEC Construction Permit Nos. CPPR-91 and CPPR-92 for the Watts Bar Units 1 and 2 facilities, and to the discussion of our findings held by Mr. Foster with Mr. J. C. Killiam 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.

One new unresolved item resulted from this inspection and is identified in Section III of the summary of the enclosed report. This item will be examined on subsequent inspections.

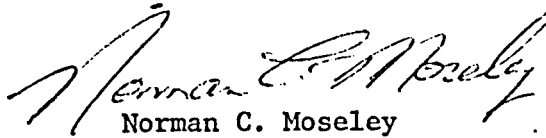
In accordance with Section 2.790 of the AEC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed inspection report will be placed in the AEC's Public Document Room. If this report contains any information that you believe to be proprietary, it is 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 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,

AUG. 23 1974

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.
50-390/74-4 and 50-391/74-4

RO Inspection Report Nos. 50-390/74-4
and 50-391/74-4

AUG 23 1974

TENNESSEE VALLEY AUTHORITY
Watts Bar 1 and 2

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Letter to Tennessee Valley Authority from N. C. Moseley
dated . **AUG 23 1974** 50-390/74-4 and
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AUG 23 1974

RO Inspection Report Nos. 50-390/74-4 and 50-391/74-4

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, Unannounced

Dates of Inspection: July 31-August 2, 1974

Dates of Previous Inspection: April 23-25, 1974 (Facility)
May 2-3, 1974 (Vendor)

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

Accompanying Inspector: W. B. Swan, Reactor Inspector
Engineering Section
Facilities Construction Branch

Other Accompanying Personnel: None

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

8/21/74
Date

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

8/22/74
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 Item

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

The license was informed of reported malfunctions of Westinghouse Type W-2 Control Switches that had occurred at another facility. This item is considered unresolved until the licensee's action on switches ordered for Watts Bar is evaluated. (Details I, paragraph 8)

IV. Status of Previously Reported Unresolved Items

None

V. Design Changes

None

VI. Unusual Occurrences

None

VII. Other Significant Findings

The licensee reported that the Birmingham Plant of the containment contractor (CB&I) has been on strike since May 1974. Watts Bar is still obtaining anchor bolts from the contractor's sub-contractor; however, the strike may affect the start date of Unit 1 containment.

TVA only received one bid on the large (500,000 gallon) hold-up tanks and the price has doubled. TVA is considering going out for bids to have the tank fabricated in place.

A. Project Status

Overall construction is 12% complete. The reactor vessels and steam generators are expected to be delivered in October 1974. Research-Cottrell, Incorporated expects to top out the first cooling tower in November 1974.

B. Personnel

Approximately 1,888 personnel including 156 contract people are presently on site. The QA reorganization has been approved and will be put into operation in August 1974. Site QA personnel will report to W. Diebler, Chief DEC QA Staff (Knoxville). Mr. L. C. Northard is Site QA Supervisor.

C. Training

Watts Bar has 116 apprentices in all crafts. Approximately 5,113 hours have been expended on training activities. Training schedules and lectures have been prepared. The lectures cover ten different areas in QA and nine areas affecting the trade personnel.

Preliminary issue of Quality Control Procedure No. DEC-QCP-1.11, "Quality Assurance Training Program," has been prepared and is being implemented.

VIII. Management Interview

The management interview was held with Mr. J. C. Killian, Construction Project Manager, members of his staff and representatives from OEDC Knoxville.

The licensee was informed that TVA's response to RO Bulletin 74-6 concerning W-2 switches was not adequate and this would be an unresolved item. Other inspection findings discussed were as follows:

- A. Training Program
- B. Weld Rod Control
- C. Overall QA Program
- D. Site Audits
- E. Concrete Batch Plant Equipment
- F. Procedure Development
- G. Project Status
- H. Concrete Testing
- I. Charging and Safety Injection Pumps

The inspectors stated that there were no violations or unresolved matters pertaining to these items.

DETAILS I

Prepared By:

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

8/21/74
Date

Dates of Inspection: July 31 - August 2, 1974

Reviewed By:

J. J. Bryant
J. J. Bryant, Senior Inspector
Facilities Section
Facilities Construction Branch

8/22/74
Date

All information in Details I applies 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
L. C. Northard - Site QA Supervisor
R. L. Heathery - Supervisor, Quality Control & Record
Engineering Unit
C. E. Thompson - Civil Engineer, QC and Records
Engineering Unit
J. Morgan - Welding Engineer

2. Site Audits

The licensee's audit activities were examined to determine if audits are being performed in accordance with the licensee's audit procedure No. DEC-QCP-1.5. Audits conducted since May 1, 1974, were examined. Results of the examination showed that 12 formal site audits have been performed since May 1974. These consisted of two electrical, three mechanical, five civil and two general audits. Eleven formal audits are scheduled for the next quarter. These audits are planned to cover all areas of the facility presently under construction. The audits are to be conducted on an average of one per week based on the construction activity. Concurrently with the formal audits, continuous surveillance is being performed on all disciplines by the QC and Records Unit. The inspector has no further questions.

3. Procedures and Instructions

The licensee's development and implementation of construction procedures to ensure quality construction were examined. The licensee has prepared ten general procedures, seven civil procedures, two electrical procedures and five mechanical procedures. Six more construction procedures are in various stages of development. Results of examination revealed that the Watts Bar procedures are being developed and implemented commensurate with the Project Status. The inspector has no further questions.

4. Training Program

The inspector examined the Watts Bar Training Program to determine if personnel performing activities affecting quality were being trained. Examination showed that a preliminary procedure No. DEC-QCP-1.11 "Quality Assurance Training Program" has been prepared and training is being given to QA, supervisory and trade personnel. The inspector has no further questions.

5. Corrective Action

Measures established and implemented to assure that the licensee promptly identifies and corrects conditions adverse to quality were examined. Watts Bar utilizes a log book to keep track of conditions adverse to quality. This log book is indexed for each discipline and contains adverse condition forms which state the condition, recommended corrective action and action completed. Spaces for personnel signatures are provided and copies are sent to management. Audit reports and office memorandums are also utilized to report, request action and close out conditions adverse to quality. Examination of the above measures did not reveal any deficiencies.

6. QA Program and Organization

The organization of the site QA Unit was examined to ensure that they were performing their function as described in the PSAR and if they were exercising their authority to stop work when adverse quality conditions were found. The examination of audits, adverse condition reports, corrective actions, QC inspection reports, documentation of concrete and steel placement, concrete batch plant laboratory reports, actual construction activities and discussions with personnel did not reveal any deficiencies.

Effective August 5, 1974, the site QA Unit will report to the Chief DEC Staff, Knoxville. This group will initially consist of three QA engineers and a QA supervisor. The QC and Records Engineering Unit consists of eight engineers who will continue to report to the Construction Engineer. The inspector has no further questions.

7. Weld Rod Control

The inspectors examined the licensee's method to control the return of unused weld rod and found that the system needs to be improved. Presently, Watts Bar has rod disposal booths which contain a locked metal box. Each welder is required by procedure to put all unused rods into the locked box for reconditioning. The inspectors found rods protruding from the locked box and easily removed five rods. Other rods were lying loose in the booth. Loose rods were also found on the concrete containment base slab of Unit 2. Examination of audit reports revealed that weld rod control has improved since the start of the project; however, the inspectors pointed out that weld rod control is a continuing critical item and would be inspected during each AEC inspection, particularly when Class I piping, components and structures are being fabricated.

The licensee stated that they understood the importance of controlling weld rod and are reducing deficient areas by continual training of personnel and monitoring of work areas.

No violation was cited from the above findings because no safety critical work was involved.

8. Defective Control Switch Component

RO Bulletin No. 74-6 notified the licensee of deficiencies found in the Westinghouse W-2 control switches and requested that the licensee submit plans for corrective action. TVA's response letter dated July 26, 1974, stated that "no W-2 switches have been shipped from Westinghouse for the Watts Bar Plant; therefore, TVA does not feel it is necessary to extend this inspection program to the Watts Bar Plant." RO has evaluated the licensee's response and finds it unacceptable. This is considered an unresolved item until TVA decides what action will be performed on these switches prior to shipment to Watts Bar; i.e., will the switches be modified and tested at the vendor's plant to correct the problem or will the original switches be shipped and correction performed at the site.

DETAILS II

Prepared by:

W. B. Swan
W. B. Swan, Reactor Inspector
Engineering Section
Facilities Construction Branch

8/17/74
Date

Dates of Inspection: July 31 - August 2, 1974

Reviewed by:

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

8/16/74
Date

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

1. Individuals Contacted

Tennessee Valley Authority (TVA)

Site Personnel

J. C. Killian - Project Manager
T. B. Northern - Construction Engineer
L. C. Northard - Supervisor, Field QA
R. L. Heatherly - Unit Supervisor, Quality Control and Records
Engineering Unit
H. S. Sheppard - Unit Supervisor, Civil (F) Engineering Unit
J. C. Cofield - Unit Supervisor, Materials Engineering (C&S) Unit
J. Morgan - Mechanical Engineer, Welding and NDT
K. A. Hasting - Construction Engineering Associate, Mechanical
Engineering Unit
J. M. Lamb - Mechanical Engineering Unit
J. A. Nicholls - Civil Engineer, Surveying
R. L. Honeycutt, Civil Engineer, Reinforcing Steel

OEDC, Knoxville

C. D. Bilinger - DED QA Staff
L. G. Hebert - OEDC - QA

2. Class 1 Concrete, Containment and Auxiliary Building

The inspectors observed pre-placement preparations, placement of concrete in two walls of the auxiliary building; and manufacture

and transport of concrete mix. The testing laboratory and batch plant facilities were inspected. Bending of reinforcement steel and its surveillance by mechanical engineers was reviewed with the reinforcement section engineers.

No violations or significant deficiencies were found. There were some questionable items discussed with the licensee.

- a. **Timing and frequency of concrete sampling:** The specification calls for sampling within one hour after the start of mixing and at varying frequencies for differing mixes. The inspector observed one evening that sampling was delayed until three hours had passed. Discussion revealed that the batch plant inspector had misunderstood his supervisor's verbal instructions on timing. He was reinstructed. TVA initiated changes to the sampling frequency, expecially where several types of concrete are mixed during a single shift.
- b. When the inspector noted that the Calibration sticker on the 300,000 pound Southwark Concrete testing machine was out of date, the licensee explained that this second hand machine had been recently transferred to the site. Calibration by the TVA consultant had been requested and site personnel had calibrated the machine against a second calibrated machine.
- c. **Deficient Dust Shields on Mixing Equipment:** The inspectors noted excessive loss of cement powder through a flexible connection between the cement hopper and the weigh tank and a flanged joint (from which five bolts were observed to be missing) in the swivelling duct section at the mixer entrance. The licensee was found to have in preparation a design change for the flexible connection. The missing bolts at the flanged joint were replaced soon after the discovery that they were missing.
- d. Possible Compromise of Batching Scales From Buildup of Cement Deposits on Fulcrum Arms of Scales

The inspectors noted a buildup of cement deposits on the scale arms. The licensee was aware of the problem and have been cleaning the debris off at frequent intervals and checking the scales with dead weights. The records show that the scales have been kept well within tolerance. Air guns were used for cleaning the scale mechanisms during the inspection.

No problems were encountered in the procedures and records for component qualification. A total of eight analyses of the Tennessee River water had qualified its use for concrete mixing since the start of the project.

Concrete Placement Record: TVA Watts Bar personnel stated that a record for volume of concrete placed in a one year period for a utility power plant was attained between July 20, 1973, and July 19, 1974, with the placement of 101,476 cubic yards of which all but 707 cubic yards were mixed by the site batch plant. The average exceeded 400 cubic yards per working days.

3. Review of QC Systems for Welding Structures and Supports for Equipment and Containment Liner

Procedures for welding and welding QC were found to be in order. The mechanical engineers monitor the field welding. No welding had been done on Class 1 structures or supports except for tack welding of restraint rods on embedments prior to concrete placement.

4. Documentation Control of Structural Items and Embedded Supports (Records)

Verification of correct positioning of structural members and supports to be embedded in provided by surveyors in the field civil engineering section. The inspector was shown records held by this section of calculations and measurements made during positioning. There were no unresolved questions.

5. Reinforcing Steel Quality Control

Engineers in the civil field engineering unit monitor the bending and placement of rebar to assure that procedure and drawing requirements are met. The licensee reported that the A-615 rebar has not developed cracks when bent to the radii specified on the drawing and that dimensional control has not been a problem. Regular, staggered inspections are made of the bending operations. In-place rebar is inspected when installed and rechecked just prior to concrete placement.

Prefabricated assemblies of electrical and mechanical penetrations constitute a special quality control problem when their insertion requires cutting or bending of in-place rebar. Cut rebars or that judged to have been compromised by excessive bending is replaced or supplemented by additional bars.

Viability of the control program was attested by corrective action taken after a QA audit disclosed that attachments had been welded to structural rebar to support a penetration assembly. This is prohibited by the construction procedure although A-615 rebar is classed by ASTM standards as "weldable."

Corrective action consisted of drilling holes in the concrete and inserting additional rebars. The licensee thereby demonstrated that his QC program was working so this incident is not considered to be a violation.