

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
50-390/74-2
50-391/74-2

MAY 29 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 Mr. W. B. Swan of this office on April 23-25, 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. Swan 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 violations were disclosed.

We have also examined actions you have taken with regard to previously identified enforcement matters and unresolved items. The status of these items is identified in Sections II and IV of the summary of the enclosed report.

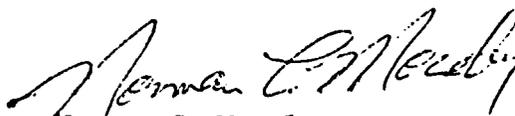
In accordance with Section 2.790 of the AEC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed inspection report will be placed in the AEC's Public Document Room. If this report contains any information that you believe to be proprietary, it is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

MAY 29 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.
50-390/74-2 and 50-391/74-2

Letter to Tennessee Valley Authority from N. C. Moseley
dated MAY 29 1974 50-390/74-2 and
50-391/74-2

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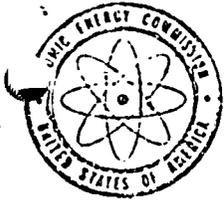
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REGION II - SUITE 818
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TELEPHONE: (404) 826-4503

RO Inspection Report Nos. 50-390/74-2 and 50-391/74-2

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: April 23-25, 1974

Dates of Previous Inspection: February 7-8, 1974

Inspector-In-Charge: W. B. Swan, Reactor Inspector
Engineering Section
Facilities Construction Branch

Accompanying Inspectors: None

Other Accompanying Personnel: None

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

5/24/74
Date

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

5/24/74
Date

SUMMARY OF FINDINGS

I. Enforcement Action

A. Violations

None

B. Safety Items

None

II. Licensee Action on Previously Identified Enforcement Matters

A. Violations

The following violation resulted from a vendor inspection at Rotterdam Dockyard Company (RDM), Rotterdam, The Netherlands.

73-1-A1 (999-39) Control and Audit of Purchased Equipment

The licensee has stated that the QA program for the TVA representative at the RDM plant has been revised and is being implemented. The licensee also states that a comprehensive audit of TVA, Westinghouse and Rotterdam Dockyard QA Programs has been performed.

RO will examine the QA program and its implementation during an inspection scheduled for May 2-3, 1974. This item remains open.

B. Safety Items

None

III. New Unresolved Items

None

IV. Status of Previously Reported Unresolved Items

The following unresolved item resulted from a vendor inspection at Rotterdam Dockyard Company (RDM), Rotterdam, The Netherlands.

73-2/1 (999-39)

Design Review and Documentation

The licensee stated that documentary evidence has been prepared and is available to ensure that the reactor vessels are in conformance with the requirements of the ASME Code, Section III, 1973 Edition, including the Addenda through Winter of 1971.

RO will examine the documents during an inspection scheduled for May 2-3, 1974. This item remains open.

V. Design Changes

None

VI. Unusual Occurrences

None

VII. Other Significant Findings

Increasing difficulties are being encountered by TVA with vendors' procurement of materials and equipment. The licensee stated that vendors are beginning to lose interest due to 10 CFR 50 requirements. (Details I, paragraph 14)

TVA is considering placing control of field QC directly under the Director of Construction.

A. Project Status

Overall construction is approximately 8% complete. Seventy thousand cubic yards of Class I concrete have been placed. Placement of permanent concrete for both reactor buildings has started. Unit 1 reactor containment sump liner has been set and aligned and the sump liner for Unit 2 is onsite.

The first Class I pipe welds have been made and were accepted. These welds were performed on the 24-inch RHR guard piping.

B. Personnel

Approximately 1450 TVA personnel are presently on site. TVA is continuing to add more QA and engineering personnel to the site staff.

C. Training Program

The training officer is onsite. Training courses on concrete placement and pipe fitting have been presented to the construction and craft personnel. An onsite welding apprentice course has been started for all crafts which have weldors. (Details I, paragraph 3)

VIII. Management Interview

The results of the inspection were discussed with J. C. Killian, Project Manager, members of his staff and QA representatives of OEDC and DED Knoxville at the conclusion of the inspection.

DETAILS I

Prepared By:

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

5/16/74
Date

Dates of Inspection: April 23-25, 1974

Reviewed By:

B. J. Cochran
B. J. Cochran, Acting Senior
Inspector, Engineering Section
Facilities Construction Branch

5/16/74
Date

All information in Details I applies equally 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 - Unit Supervisor, Quality Control and Records
Engineering Unit
- H. S. Sheppard - Unit Supervisor, Civil (F) Field Engineering Unit
- J. C. Cofield - Unit Supervisor, Materials Engineering (C&S) Unit
- J. A. Lawhorne - Construction Inspector, Materials Engineering (C&S)
Unit
- K. A. Hasting - Construction Engineering Associate, Mechanical
Engineering Unit
- C. E. Thompson - Civil Engineer, QC & Records Engineering Unit
- R. L. Heatherly - Mechanical Engineer, QC & Records Engineering Unit
- S. D. Davis - Civil Engineer, QC & Record Engineering Unit
- D. G. Clark - Principal Mechanical Engineer
- J. G. Shields - Principal Electrical Engineer
- H. C. Richardson - Assistant Construction Engineer
- G. N. Myers - Electrical Engineer, Electrical Engineering Unit
- J. M. Lamb - Mechanical Engineering Supervisor
- W. K. Foust - Construction Inspector
- J. S. McConky - Materials Tester

C. E. Bryant - Assistant Supervisor, Warehouse Services Unit
H. S. Odum - Property and Supply Officer, Warehouse Service Unit
F. W. Lawhern - Steamfitter Superintendent
R. C. Davis - Assistant General Construction Superintendent, Second Shift
J. R. Nickell - Training Officer
J. Brown - Training Officer, Browns Ferry Plant

2. Status of Construction Procedure Development

Approved quality control procedures were found for the following categories:

8 - General
5 - Civil
1 - Electrical
5 - Mechanical

In addition, preliminary procedure DEC-QCP-3.1 "Handling, Storage and Maintenance of Permanent Electrical Equipment" and preliminary procedure DEC-QCP-2.6, "Crushed Stone Backfill Placement, Inspection and Documentation," were in the approval chain and were being implemented as appropriate to work in progress and equipment receivals.

Development of construction specifications and quality control procedures was judged to be commensurate with the work progress.

3. Status of Training Program

A followup review was made of the development of training courses and of their implementation. The inspector held discussions with the supervisor of the QC and records group and the training officer. The Browns Ferry training officer was present during the discussions. The inspector was shown the written course content for concrete placement, welding, pipe fitting, equipment operation and maintenance, electrical installation, quality control and NDT.

Construction supervisors, the supervisor of QC, and specialists are being utilized for instruction of craftsmen and NDT personnel. For example, a welding specialist assigned to the supervisor of the

mechanical engineering unit has had twenty years experience with welding and NDT for the Navy Bureau of Ships and is being utilized for instruction in these specialities. Each instructor is required to polish his training lectures by video taping and retaping until they are satisfactory for fifteen minute sessions.

The personnel record of each trainee is credited for each training session plus the instructor's file is posted to record courses taught.

4. QC Audits Completed

Completed audits are listed below. The inspector was given the audit reports pertaining to welder qualifications, welding material control, concrete placement and the testing of components and mixing.

<u>PROCEDURE/ACTIVITY</u>	<u>DATE COMPLETED</u>
DEC-QCP-4.1 - Procurement, Storage, Issue and Control of Welding Material	2/6/74
DEC-QCP-2,3 - Fabrication and Inspection of Miscellaneous Steel	2/13/74
DEC-QCP-3.2 - Inspection of Embedded Conduit and Grounding	2/21/74
DEC-QCP-1.6 - Receipt, Inspection, Storage, and Withdrawal of Permanent Material	3/6/74
DEC-QCP-2.2 - Concrete Placement and Documentation	3/14/74
DEC-QCP-4.2 - Welder and Welding Operator Qualification	4/9/70
DEC-QCP-3.1 - Handling, Storage, and Maintenance of Permanent Electrical Materials	3/21/74
DEC-QCP-1.1 - Print Room Procedure	3/29/74
DEC-QCP-2.7 - Inspection and Documentation for Erection of Miscellaneous Steel	4/3/74
DEC-QCP-2.1 - Backfill Materials Placement, Inspection, and Documentation	4/17/74

5. QC Audits Scheduled

Additional audits scheduled for April, May and June are listed:

DEC-QCP-2.2 - Concrete Placement and Documentation	4/10/74
DEC-QCP-1.3 - Preparation and Implementation of Field Fabrication Orders	4/20/74
DEC-QCP-4.2 - Welder and Welding Operator Performance Qualification	4/24/74
DEC-QCP-2.3 - Fabrication and Inspection of Miscellaneous Steel	5/8/74
DEC-QCP-3.1 - Handling, Storage, and Maintenance of Permanent Electrical Materials	5/15/74
DEC-QCP-4.4 - Certification of Nondestructive Testing Personnel	5/22/74
DEC-QCP-1.7 - Release for Drilling, Chipping, Cutting off, or Welding to Permanent Structures or Components	5/29/74
DEC-QCP-1.2 - Control of Nonconforming Material	6/5/74
DEC-QCP-4.3. - Welding Surveillance and Weld Procedure Assignment	6/12/74
DEC-QCP-3.2 - Inspection of Embedded Conduit and Grounding	6/19/74
DEC-QCP-4.1 - Procurement, Storage, Issue and Control of Welding Material	6/26/74

6. Warehouses, Sheltered Materials Racks, and Storage Yards

The licensee has provided warehouses and other storage facilities with sufficient capacity and quality to provide care of stored equipment and material. The facilities inspected include:

- a. Two Main warehouses of 21,000 square feet area each with separate locked spaces for welding material, instrumentation, tools, and discrepant materials.

- b. Eighteen warehouses of 4,000 square feet, lighted by skylights, and with concrete floors.
- c. Two environmentally controlled warehouses of 4,000 feet.
- d. Warehouse for storage of motors requiring heater connections. Lift off roof sections are provided for crane access to any part of the building.
- e. A two story concrete block building and six large sheds in yard No. 4 for sun shielded storage of insulated electrical cable.
- f. Storage Yard No. 3 has three parallel railroad spur tracks and platforms and cribbing for the largest vessels and equipment.

In addition to storage facilities, the licensee has provided:

- a. A stamping machine for metal identification tags for all cable reels.
- b. An addressograph machine to produce plastic "no fade" identification tags for piping, valves, tanks, etc.

7. Concrete Placement and Testing

During the inspection, concrete was placed for the base portions of both reactor containment shield buildings, the control building, auxiliary building and turbine building. Forms preparation and cleaning, concrete placement and mix testing, forms removal, and concrete curing were observed. No discrepancy was noted.

The inspector reviewed the licensee's sixty one page "Monthly Concrete Quality Report" dated April 10, 1974, which demonstrates close quality control on components and mixes.

8. Concrete Batch Plant

The licensee was found to have completed the ice and/or chilled water facilities for the batch plant. The facilities were used during the inspection. Backup ice storage was provided. Water heating facilities for cold weather mixing are also available. The batch plant and supporting component storage, handling and testing facilities are now fully operational.

9. Geologic Report on Foundation Conditions For Reactor Containment and Contiguous Structures

The licensee told the inspector that copies of a report on an investigation of faults in the shale substructure at the reactor site were being forwarded to Licensing. The inspector reviewed the report. The report is dated April, 1974 and was issued by TVA's Division of Water Control Planning Geologic Branch, and is entitled "Investigation of Foundation Conditions for Unit 1 and 2, Watts Bar Nuclear Plant."

The inspector's review disclosed no item of concern.

10. Brittle Fracture Cracking of Reinforcing Steel During Bending Operation

The inspector reviewed a TVA memoranda concerning the discovery of longitudinal brittle cracks in No. 9 and No. 11 A615, Grade 60 reinforcing steel bars when they were bent around an 8" pin. Tests at TVA's Singleton laboratory confirmed the acceptability of the physical and chemical properties of the rebar. It was found that cracking had occurred because bending done around an 8" pin was too sharp a bend for the No. 9 and No. 11 A615 bars. TVA's standard drawing 30B519R4 specifies a minimum size pin of eight times the bar diameter. This requires a 9" pin for No. 9 bars and 11.3 inch for No. 11 bars. With an 8" pin the bars were stressed beyond design limits. The licensee's bending shop is conforming to the drawing requirements on bending pin sizes and no cracking has been noted on production bending.

11. Preventive Treatment of South and East Walls of Reactor No. 2 Cavity

The inspector reviewed a TVA memoranda of March 28, 1974, concerning the discovery of a disintegrated shale pocket in the south cavity wall of Reactor Building No. 2, while holes were being drilled for installation of form hold-back J-bars. Sufficient additional horizontal and vertical holes were drilled to determine the size and conformation of the disintegrated shale pocket. The Geologic Branch issued instructions on April 10, 1974, for flushing and grouting the pocket and for consolidation grouting of the south and east walls of the No. 2 reactor cavity. At the time of this inspection, corrective work had been completed but stipulated records had not been forwarded to the Division of Engineering Design.

The licensee's investigation and corrective actions left no questions open for the inspector.

12. Inspection of Embedment Anchors for Steel Containments

The erector for the steel containments, Chicago Bridge and Iron Company, had delivered nineteen large heavy plate shop fabricated anchor embedments. These were marked with the shop order number, 4333 and individual piece designations: 18-1, -6, -7, -8, -10, -11, -12, -13, -14, -20, -21, -22, -23, -24, -25, -28, and three others for which piece numbers were not noted.

Anchor Nos. 18-28 had been released from the shop prior to a required magnetic particle (MT) test. The fabricator had sent a technician to the site where all welds were MT tested and found to be satisfactory. A large steel sump box for RB-2 had been delivered. It was numbered 4333-23-A.

The inspector was told that the containments are being erected on a turnkey contract; so materials are unloaded by TVA but remain the property and QC concern of CB&I. Test or shop release documents were not available at the site or in Knoxville at the time of this inspection.

The inspector made a visual inspection of the welds. No discrepancy was noted.

13. Radiographs of Welds

On April 25, 1974, the inspector inspected completed welds and the radiographs of four or five completed welds on two 24" casing pipes for RHR pipe connections to a sump box in the base of Reactor No. 2. The radiographs of the shop welds were accepted. On field weld RHR-1-1 two areas of porosity were found and on weld RHR-1-2 one area of porosity was detected. The defects had been ground out and radiographs of the repaired areas showed them to be clear. The radiographs were of the correct density and penetrameter markings could be discerned.

14. Licensee Inquiry Concerning Internal Upgrading of Materials for QC Acceptability

The licensee told the inspector that TVA and other licensees are encountering increasing difficulty in obtaining materials and equipment fabricated under the stringencies of Appendix B to 10 CFR 50. The number of NO-BIDS is increasing and some bids are not responsive to the QA/QC requirements. Previous reliable suppliers have enough non-nuclear business to meet shop capacities and do not choose to equip themselves, or exert themselves where already equipped, to qualify for the nuclear business. Where bids are received, a high premium is added to the quoted price.

At the management interview, the inspector was asked concerning Regulatory's position on internal upgrading of off-the-shelf piping, piping components and structural shapes for example. The licensee would make or obtain all the chemical, physical, and performance tests after procurement. The inspector stated that he knew of no Regulatory position on this matter but that he could see problems of traceability for generic considerations and problems where various tests would best be made at stop points in the fabrication process.

The project manager then stated that OEDC would be requested to send a letter of inquiry to Licensing but he requested that the matter be referred to DRO-HQ through this report.

15. Installation Schedule for Containments

The inspector reviewed a TVA memorandum dated April 3, 1974, that shows CB&I field fabrication of the RB-1 steel containment floor plate to start on September 2, 1974.

16. Welding Records

The welding and NDT engineer described an expanded computerized weld record program under development for Watts Bar. The site has also developed a printed envelope for radiographs of individual welds. On this will be recorded details of the technique used, weld and personnel identification data, an evaluation of all films, and a sketch of the source positioning. It is proposed to insert in the envelope a copy of the computerized read out data for the weld.

RO Inspection Report Nos. 50-390/74-2 and
50-391/74-2

MAY 29 1974

TENNESSEE VALLEY AUTHORITY
Watts Bar 1 and 2

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