



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
230 PEACHTREE STREET, N.W. SUITE 1217
ATLANTA, GEORGIA 30303

In Reply Refer To:
RII:BJC
50-390/78-11
50-391/78-9

JUN 01 1978

Tennessee Valley Authority
Attn: Mr. N. B. Hughes
Manager of Power
830 Power Building
Chattanooga, Tennessee 37401

Gentlemen:

This refers to the inspection conducted by Dr. B. J. Cochran of this office on May 2-5, 1978, of activities authorized by NRC Construction Permit Nos. CPPR-91 and CPPR-92 for the Watts Bar 1 and 2 facilities, and to the discussion of our findings held with Mr. H. C. Richardson 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 examinations of procedures and representative records, interviews with personnel, and observations by the inspector.

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

During the inspection, it was found that certain activities under your license appear to be in noncompliance with NRC requirements. This item and references to pertinent requirements are listed in the Notice of Violation enclosed herewith as Appendix A. This notice is sent to you pursuant to the provisions of Section 2.201 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations. Section 2.201 requires you to submit to this office, within 20 days of your receipt of this notice, a written statement or explanation in reply including: (1) corrective steps which have been taken by you, and the results achieved; (2) corrective steps which will be taken to avoid further noncompliance; and (3) the date when full compliance will be achieved.

GD

JUN 01 1978

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 (or your contractor) believe to be proprietary, it is necessary that you make a written application within 20 days to this office to withhold such information from public disclosure. Any such application must include a full statement of the reasons on the basis of which it is claimed that the information is proprietary, and should be prepared so that proprietary information identified in the application is contained in a separate part of the document. If we do not hear from you in this regard within the specified period, the report will be placed in the Public Document Room.

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

Sincerely,



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

Enclosures:

1. Appendix A, Notice of Violation
2. Inspection Report Nos.
50-390/78-11 and 50-391/78-09

cc w/encl:

Mr. J. E. Gilleland
Assistant Manager of Power
830 Power Building
Chattanooga, Tennessee 37401

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

Mr. J. F. Cox
400 Commerce Street
W9D214
Knoxville, Tennessee 37902

APPENDIX A

NOTICE OF VIOLATION

Tennessee Valley Authority

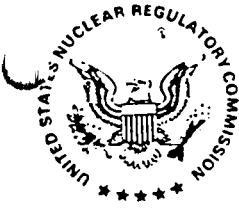
License No. CPPR-91

Based on the results of the NRC inspection conducted on May 2-5, 1978, it appears that certain of your activities were not conducted in full compliance with NRC requirements as indicated below. These items have been categorized as described in our correspondence to you dated December 31, 1974.

10 CFR 50, Appendix B, Criterion V as implemented by Watts Bar FSAR Section 17.1A.5, states in part that "Activities affecting quality shall be prescribed by documented instructions, procedures or drawings ... and shall be accomplished in accordance with these instructions, procedures or drawings." Paragraph 6.4.2 of WBNP-QCP-4.5 requires in part Attachment A be completed for each piece of equipment requiring periodic inspection or maintenance.

Contrary to the above, one Attachment A form was used to document inspection for four Boric Acid Transfer Pumps and one form for two Waste Condensate Pumps.

This is a deficiency.



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Report Nos.: 50-390/78-11 and 50-391/78-09

Docket Nos.: 50-390 and 50-391

License Nos.: CPPR-91 and CPPR-92

Categories: A2, A2

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

Facility Name: Watts Bar Nuclear Plant, Units 1 and 2

Inspection at: Watts Bar Dam, Tennessee
Knoxville, Tennessee

Inspection conducted: May 2-5, 1978

Inspector: B. J. Cochran

Approved by: A. R. Herdt

A. R. Herdt, Chief
Projects Section

Reactor Construction and Engineering Support Branch

5/31/78
Date

Inspection Summary

Inspection on May 2-5, 1978 (Report Nos. 50-390/78-11 and 50-391/78-09)
Areas Inspected: Status of licensee identified items and IE Bulletins;
Resolution of previously identified items of noncompliance and unresolved
items; audit of mechanical equipment storage and inspection records;
Seminar on mechanical snubbers. The inspection involved 20 inspector-
hours at the construction site and 6 hours at the corporate office by
one NRC inspector.

Results: Of the five areas inspected no apparent items of noncompliance
or deviations were identified in four areas; one item of noncompliance
(deficiency - failure to follow procedures for storage/maintenance
inspections - Paragraph 7) was identified in one area.

DETAILS I

Prepared by: *A. R. Herdt*
in B. J. Cochran, Principal Inspector
Projects Section
Reactor Construction and Engineering
Support Branch

5/31/78
Date

Dates of Inspection: May 2-5, 1978

Approved by: *A. R. Herdt*
A. R. Herdt, Chief
Projects Section
Reactor Construction and Engineering
Support Branch

5/31/78
Date

1. Persons Contacted

Tennessee Valley Authority

T. B. Northern, Jr., Project Manager
*A. W. Rogers, Supervisor QA
H. G. McFarland, QA Unit
*C. D. Christopher, Assistant Construction Engineer
*R. L. Heatherly, Supervisor, QC&R Unit
*F. Smith, Supervisor, Materials Unit
*J. S. Colley, EN DES QEB
*L. C. Northand, Supervisor, Welding
*J. H. Perdue, Supervisor, Electrical Engineering Unit
C. McNair, Electrical Technician
*J. M. Lamb, Supervisor, Mechanical Engineering Unit
J. A. Morgan, Assistant Supervisor, Mechanical Engineer Unit
*J. G. Shields, Assistant Construction Engineer
*H. C. Richardson, Construction Engineer
S. Johnson, Assistant Construction Engineer
J. D. Shanlever, Mechanical Engineer
F. D. Bradford, Mechanical Engineer
J. A. Kerr, Mechanical Engineer
J. P. Knight, QA Manager, OEDC
C. S. Walker, Supervisor, NLS
C. A. Myers, Supervisor, NLS PWR Group
J. F. Cox, Supervisor, NLS BWR Group
W. K. Anders, OEDC QA
*L. G. Hebert, OEDC QA
*W. Poling, Power QA
*J. A. Nicholls, Supervisor, Civil Engineering Unit
*T. W. Hayes, Supervisor, Instrumentation Unit
W. I. Dothard, Licensing Engineer
J. White, Mechanical Engineer

The inspector also talked with craftsmen in their work areas and members of the engineering units.

*Denotes those present at the exit interview.

2. Licensee Actions of Previous Inspection Findings

a. (Closed) Infraction (390/77-17-01 and 391/77-17-01):
Failure to Follow Weld Control Procedures

The licensee acknowledged the infraction and initiated corrective action to prevent recurrence. The corrective action included meetings with welders to reemphasize the weld rod control program and importance of controlling weld rod, plus continuous surveillance checks of all work areas looking for rod not being properly controlled.

This item is considered closed.

b. (Closed) Deficiency (390/78-07-01 and 391/78-06-01): Failure
to Follow Quality Control Procedures

The licensee acknowledged the deficiency and initiated corrective action to prevent recurrence. The corrective action included revising procedure WBNP-QCP-4.5 "Handling, Storage and Maintenance of Permanent Mechanical Equipment", to add new paragraph 6.3.9. This paragraph directs the responsible engineer to inspect the surface of equipment placed in storage for rust or any form of contamination which may be detrimental to the intended function of the equipment.

Inspection of the reactor coolant pump internals confirmed that rust had been removed from the cap screws and a rust inhibitor applied to prevent further rusting. Records confirm that inspections are being performed according to schedules.

This item is considered closed.

c. (Closed) Unresolved Item (391/77-13U5): Polar Crane Weld

Licensee reported that as a result of discovering deficient welds on the Unit 2 polar crane the Unit 1 polar crane was inspected. This inspection identified four welds on the bridge assembly tie ends which contain slag inclusions and exhibit lack of fusion beyond the limits of AWS-D1.1-72. The deficient welds were repaired according to written procedure and examined by magnetic particle test G-29M.

This item is considered closed.

d. (Closed) Unresolved Items (391/77-15U1): Field Instructions for Installation of Steam Generators

Field Instruction for the Installation of the Steam Generator, WBNP-M-11, was revised to require installation documentation be recorded on MIQP, Manufactures and Installers Quality Plan, operation sheets. Examination of the completed documents confirm that the steam generator setting measurements are properly recorded.

This item is considered closed.

e. (Closed) Unresolved Item (390/77-17U1): Mechanical Equipment Storage Records

This unresolved item is escalated to a deficiency (refer to paragraph 7) and is considered closed.

f. (Closed) Unresolved Item (390/78-07-02): ASME Code Manufacturers Data Report

The licensee has received a copy of the ASME Report for the Reactor Coolant Pump Casing. The report was examined and found to contain the necessary information.

This item is considered closed.

g. (Closed) Unresolved Item (390/78-08-01): Mechanical Snubber Hang-Up

As a result of questions by the NRC inspector regarding noisy and erratic operation of the mechanical snubbers, the licensee scheduled the manufacturer to conduct a seminar at the Watts Bar Site on the operation of the snubbers. The Pacific Scientific representative met with approximately thirty licensee representatives (engineers and construction supervisors) and explained the detailed operation of the snubber. He stated that the noisy and erratic operation when stroked by hand is normal because the velocity due to manual stroking is much greater than during normal operation.

As a result of further discussions between the licensee and the manufacturers representatives it was agreed that in order to get test data TVA will return two snubbers to the manufacturer for further testing.

This item is considered closed.

3. Unresolved Items

No new unresolved items were identified during this inspection.

4. Independent Inspection Effort

This inspection effort concerned the status of construction and installation of components for Units 1 and 2. The inspector talked with craftsmen and observed their work activities. The areas inspected included the auxiliary building, Unit 1 containment building, cable spreading room and the control room. The inspector observed craftsmen welding and performing dye penetrant checks of the reactor pit liner, installation of ice condenser supports, and installation of electrical tray supports.

No items of noncompliance or deviations were identified.

5. IE Bulletins

a. (Closed) IEB 77-03, "On-Line Testing of the Westinghouse Solid State Protective Systems"

RII has received TVA's letter of response dated November 11, 1977. Future routine inspections and discussions with responsible TVA personnel, review of correspondence relative to the subject matter, and review of the TVA test procedure for the Westinghouse solid state protection system will verify that the commitments of the letter of response are being carried out. The RII principal inspector for operations will follow this item. RII has no further questions at this time regarding this matter.

b. (Closed) IEB 77-04, "Calculational Error Affecting the Design Performance of a System for Controlling pH of Containment Sump Water Following a LOCA"

RII has received TVA's letter of response dated January 23, 1978. Watts Bar has an ice condenser containment and as such, utilizes boron tetraborate in the ice for containment sump pH control.

TVA reported that based on conservative calculations using conservative water volume and boron concentration values a limited concentration results. The limited concentrations is included in plant technical specifications. RII has no further questions at this time regarding this matter.

c. (Closed) IEB 77-05 and 77-05A "Electrical Connector Assemblies"

TVA has advised by letter dated January 17, 1978 that subject electrical connector assemblies have not been utilized in Watts Bar systems required to perform safety functions. RII has no further questions at this time regarding this matter.

d. (Closed) IEB 77-07 "Containment Electrical Penetrations Assemblies at Nuclear Power Plants Under Construction"

TVA has reported by their letter of January 20, 1978, the electrical containment penetrations for Watts Bar utilize epoxy seals which do not require a dry nitrogen pressure environment for functional capability. RII has no further questions at this time on this matter.

e. (Closed) IEB 77-08 "Assurance of Safety and Safeguards During an Emergency - Locking Systems"

TVA has advised by letter dated March 1, 1978 that Watts Bar is equipped with electrical locking devices which will operate in the following manner:

With primary or auxiliary power: Entry by card reader or card reader and knob. Exit by mechanical or electric device, i.e., knob or pushbutton.

In the event of power failure: All electric locking devices fail in the open mode. Entry by knob or other mechanical device. Exit by knob or other mechanical device.

Selected doors are being provided with auxiliary key locks in conjunction with knobs and latches which can be secured externally by appropriate employees and exit by knob from within.

RII has no further questions on this matter at this time.

f. (Closed) IEB 78-01 "Flammable Contact - Arm Retainers in GE CR120A Relays"

TVA has reported by their letter of March 20, 1978, they have reviewed the design of our plants with construction permits and have determined that none of the relays of the type described in the bulletin are installed or scheduled to be installed in class IE systems. RII has no further questions on this matter at this time.

g. (Closed) IEB 78-02 "Terminal Block Qualification"

TVA has advised by letter dated March 1, 1978 that a review of the affected nuclear plants revealed that TVA neither uses, nor do we plan to use, unprotected terminal blocks in systems which must function in the post-accident environment.

RII has no further questions on this matter at this time.

h. (Closed) IEB 78-04 "Environment Qualification of Stem Mounted Limit Switches"

TVA has advised by letter dated April 24, 1978 that a program has been initiated to replace these switches with new NAMCO snap lock switches.

RII has no further questions on this matter at this time.

6. Licensee Identified Items (50.55(e))

a. (Closed) 50.55(e) (390/78-11-01) "Crack in Unit 1 Reactor Cavity Bulk Head-NCR-1018R"

On January 6, 1978, TVA notified RII that a crack was discovered in the heat affected zone of a fabrication weld for the barrier between the reactor cavity and the primary coolant pipe chase just below one of the four reactor cold leg nozzles.

The crack was eliminated by grinding and repaired using weld procedure SM-U-1. The repair was accepted following visual and magnetic particle testing.

This item is considered closed.

b. (Open) 50.55(e) (390/78-11-02 and 391/78-09-01) "Ice Condenser Collar Studs - NCR12"

On February 23, 1978, TVA notified RII that contrary to design requirements, ice condenser studs over 5/8 inch in diameter were not charpy V-notch (CVN) tested. As soon as the deficiency was discovered, samples of the ice condenser collar studs were taken to TVA's Singleton Lab for CVN testing. The results of these tests indicated that the studs did not meet the CVN specification requirements. Following these tests, TVA consulted Westinghouse on an alternative test to qualify the ice condenser collar studs. Westinghouse indicated that the Hammer Bend test, as outlined in AWS D.1.1, paragraph 4.2.9.1.1, was a more meaningful test

for these studs. Additionally, TVA required that a flexure test, as outlined in AWS C.5.4, paragraph 7.2.2.1, also be performed. The ice condenser collar studs from the Watts Bar Nuclear Plant met or exceeded the requirements set forth in these two AWS Standards when tested at temperatures of 70°F, 20°F, and -20°F. Based on the satisfactory completion of these tests, TVA and Westinghouse believe that the ice condenser studs are tough enough to adequately support design loads. This item remains open until IE reviews the results of these tests.

- c. (Closed) 50.55(e) (390/78-11-03 and 391/78-09-02): Excessive ERCW System Head Loss - NCR 1003"

On February 28, 1978, TVA notified RII that reanalysis of the ERCW system revealed that five ERCW subloops have friction losses in excess of the available head for the case of loss of the downstream dam. Procurement of replacement piping to the revised specifications has begun. All design changes required to ensure the ERCW system can meet design requirements will be verified by preoperational testing.

This item is considered closed.

- d. (Closed) 50.55(e) (390/78-11-04), "Main Steam Isolation Valve - NCR 302-1"

On December 2, 1977, TVA notified RII that scoring was found in the Atwood and Morrill main steam isolation valve body cylinder bores. The valves were returned to the manufacturer when the scored valve bodies were repaired by hand blending. The valves were reassembled and hydro tested prior to return to Watts Bar.

This item is considered closed.

- e. (Closed) 50.55(e) (390/78-11-05), "Containment Vessel Penetration Sleeves Out of Tolerance - NCR 1047R"

On January 25, 1978, TVA notified RII that the penetrations for the main steam and feedwater lines that connect to the bellows assembly in the containment vessel annulus were found to have inside pipe diameters and weld prep thickness different than specified.

After consultation with the bellows manufacturer it was determined that a maximum diametral expansion of 5 percent would be possible for the nozzle nipple. Calculations indicate that a maximum expansion on the order of 0.6 percent before welding the penetration sleeves and bellows will meet the alignment tolerances of paragraph NB-4233 of the 1971 ASME Code Section III. TVA will use process specification 4.M.2.1(a) (Specification for Bending or Alignment of Pipe) to perform this work in accordance with TVA's general construction specification G-29M. These procedures will produce tolerances identical to the original theoretical weld.

This item is considered closed.

- f. (Closed) 50.55(e) (390/78-11-06 and 391/78-09-04), "Faulty Diesel Generator Trip Device - NRC EEB 78-1"

On March 24, 1978, TVA notified RII that the diesel generator differential relay (device 87, Westinghouse Tupe SA-1) would sometimes operate even though there was no fault within the protection zone.

Westinghouse identification of the problem calls for a reactor assembly to be used with its SA-1 differential relays where they are subjected to "black start" (transformer energization from a generator at full voltage) or application where long d.c. time constants are encountered. TVA has made design changes incorporating the Westinghouse recommended assembly and procurement of these assemblies has been initiated.

This item is considered closed.

- g. (Open) 50.55(e) (390/78-11-07 and 391/78-09-05), "Electrical Cable For Use Inside Containment - NCR/QEB 78-2"

On January 17, 1978, TVA notified RII that some of the electrical cable, procured for use inside containment, has not been properly qualified. Specifically, this cable does not appear to meet the purchase specification requirements for aging of cable to verify 40-year life, LOCA simulation on unaged cable, insulation thickness, and similarity of construction between cable tested and purchased.

- h. (Open) 50.55(e) (390/78-11-08 and 391/78-09-06), "Faulty Cable Tray Support Installation - NCR CAQR E-5"

On March 16, 1978, TVA notified RII that an electrician at the plant site reported to his supervisor the improper installation of the cable tray supports in one area of the plant. As yet an undetermined number of surface plates and bolts that are used to attach the surface plates to concrete by means of self-drilling expansion anchors have been damaged due to improper alignment during installation.

The cause of this deficiency was that the bolts that hold the surface plates to the self drilling expansion anchors were, in some cases, not properly aligned with the holes in the surface plates. As a result, the installers improperly used force (a hammer) to align the expansion anchor bolts to the holes in the surface plates.

The extent of this deficiency is still being investigated.

- i. (Open) 50.55(e) (390/78-11-09 and 391/78-09-07), "Bill of Materials Deficient - NCR 1006"

On March 31, 1978, TVA notified RII that a corrosion allowance for TVA-procured ASME Section III, Class 3 carbon steel piping was not specified in the piping's Bill of Materials. This is required by TVA's design specifications for procurement of ASME code piping. Investigations to date indicate that proper corrosion allowances were provided in the design of the piping.

- j. (Open) 50.55(e) (390/78-11-10 and 391/78-09-03), ECCS Model Revision

On March 23, 1978, Westinghouse reported to NRC (Office of Nuclear Reactor Regulation and the Office of Inspection and Enforcement) in Bethesda, Maryland, that their approved Appendix K ECCS models contained a computer programming error affecting the zirconium-water reaction heat generation calculation.

Preliminary results from revised UHI plant calculations for another UHI plant indicate that Watts Bar should not be significantly affected.

7. Mechanical Equipment Storage Records Audit

The inspector audited the mechanical storage and inspection records against Procedure WBNP-QCP 4.5.

During this audit it was determined that paragraph 6.4.2 of the procedure was not being followed. The paragraph states that "Attachment A shall be completed for each piece of equipment requiring periodic inspection or maintenance and shall be placed in fire proof storage when not in use."

Contrary to the procedural requirements one Attachment A form was provided for four Boric Acid Transfer pumps and one form was used for two Waste Condensate Pumps.

This is identified as a deficiency 390/78-11-11, "Failure to Follow Procedures."

8. Exit Interview

The inspector met with the licensee representatives denoted in paragraph 1 at the conclusion of the inspection on May 5, 1978. The inspector summarized the scope of the inspection as follows: satisfactory resolution of two previously identified items of noncompliance, seven unresolved items, eight IE Bulletins and five licensee identified items; construction status; audit of mechanical storage records; and seminar on mechanical snubbers. One item of noncompliance was identified.