



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

MAR 22 1978

In Reply Refer To:
RII:NE
50-390/78-05
50-391/78-04

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. N. Economos of this office on February 13-16, 1978, 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. T. B. Northern 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.

Three new unresolved items resulted from this inspection and are discussed in the enclosed report. These items will be examined during subsequent inspections.

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.

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

60

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. 50-390/78-05
and 50-391/78-04

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. C. S. Walker
400 Commerce Street
W9D199
Knoxville, Tennessee 37902

APPENDIX A

NOTICE OF VIOLATION

Tennessee Valley Authority

License Nos. CPPR-92
CPPR-91

Based on the results of the NRC inspection conducted on February 13-16, 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.

Criterion V of Appendix B to 10 CFR 50, as implemented by the FSAR paragraph 17.1A.5 requires in part that, "Activities affecting quality shall be prescribed by documented instructions, procedures ... and shall be accomplished in accordance with these instructions, procedures" Procedure WBNP-QCP-2.4 Revision 2, "Erection and Inspection of Structural and Miscellaneous Steel," paragraph 6.3 states in part, that inspection personnel shall verify that structural steel is erected true and plumb, and aligned; while paragraph 5.3 requires that all required inspections be made and documented.

Contrary to the above requirements, inspections were not being performed and/or documented as required.

1. On February 14 Form "Steel Inspection Report," WBNP-QCP-2.4 Attachment A, used to document inspection and testing (NDE) of Unit 1 reactor vessel embedded support welds showed the inspection point for fitup had not been signed off for any of the eight (8) welds involved.
2. On February 15 the QC record, Form Attachment A WBNP-QCP-2.4, for the completed and in-process welds of steam generator 3, Unit 2 structural restraint plates (Tang Plates) had not been generated. Therefore, there was no objective evidence to verify that the required inspections had been performed.

This is an infraction.



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

Report Nos.: 50-390/78-05 and 50-391/78-04

Docket Nos.: 50-390 and 50-391

License Nos.: CPPR-91 and CPPR-92

Categories: A-3 and A-2

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

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

Inspection at: Watts Bar, Tennessee

Inspection conducted: February 13-16, 1978

Inspector-in-Charge: N. Economos

Reviewed by:

T. E. Conlon
T. E. Conlon, Chief

Engineering Support Section No. 2

Reactor Construction and Engineering Support Branch

3/20/78
Date

Inspection Summary

Inspection on February 13-16, 1978 (Report Nos. 50-390/78-05 and 50-391/78-04)

Areas Inspected: Structural Steel welding - observation of work and work activities, review of quality records; safety-related structures (welding) - review of quality assurance implementing procedures, observation of work activities; Unit 2 reactor vessel nozzle weld surface cracking. The inspection involved 26 inspector-hours on site by one NRC inspector.

Results: Of the six areas inspected, no apparent items of noncompliance were identified in five areas; one apparent item of noncompliance (infraction - failure to follow procedures - paragraph 4.d. and 5.) was identified in one area.

DETAILS I

Prepared by:

Nick Economos
N. Economos, Metallurgical Engineer
Engineering Support Section No. 2
Reactor Construction and Engineering
Support Branch

3/20/78
Date

Dates of Inspection: February 13-16, 1978

Reviewed by:

T. E. Conlon
T. E. Conlon, Chief
Engineering Support Section No. 2
Reactor Construction and Engineering
Support Branch

3/20/78
Date

1. Persons Contacted

a. Tennessee Valley Authority (TVA)

- *T. Northern, Project Manager
- *J. E. Treadway, Construction Superintendent
- *L. C. Northard, Welding Engineering Unit Supervisor
- *J. A. Nicholls, Civil Engineering Unit Supervisor
- *J. M. Lamb, Mechanical Engineering Unit Supervisor
- *A. W. Rogers, QA Supervisor
- Elmer White, QA Engineer
- C. Carden, Fitter
- D. Matherly, Welder
- J. O. Bennett, Fitter

b. Contractor Organization

Pittsburg Des Moines Steel Company (PDM)

- *H. R. Chandler, Site QA Manager
- *G. W. Terry, Welding Foreman

*Denotes those present at the exit interview.

2. Licensee Actions on Previous Inspection Findings

Previously identified inspection findings were not reviewed during this inspection.

3. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance or deviations. Unresolved items disclosed during this inspection are discussed in paragraph 4.a, 4.b. and 4.c.

4. Independent Inspection Effort

a. Reactor Vessel - Nozzle Weld Surface Cracking (Unit 2)

On February 15, the licensee informed the inspector that small surface cracks had been detected near the safe-end or buttered portion of reactor vessel nozzle weld number 2-068C-W004-01 on the cold leg of loop four, Unit 2 reactor vessel. The existing condition (cracking) appeared when the area in question was ground, repaired and re-examined with liquid penetrant. A second repair using the GTAW instead of the SMAW process, used on the first repair, failed to correct the aforementioned condition.

The licensee reported the problem to Westinghouse who upon a review of drawings and/or QC documents disclosed that the width of the safe-end at the surface was approximately 3/8" and that the area in question was the inconel weld metal deposit between the nozzle and the safe-end. Therefore it was concluded that the cracking resulted when the welder, inadvertently, went beyond the safe-end and deposited stainless on the inconel portion of the joint. A procedure was being generated to handle the repair.

The inspector advised the licensee that this would be an unresolved item and would be assigned item number 78-05-02.

b. Documentation of Structural Steel Erection, Inspection and Testing, Units 1 and 2

Procedural requirements controlling on-site quality control activities for structural steel are included in the following procedures:

- (1) WBNP-QCP-1.3 R₃, Fabrication and Inspection of QA Miscellaneous Steel.

- (2) WBNP-QCP-2.4 R₂, Erection and Inspection of Structural and Miscellaneous Steel.
- (3) WBNP-QCP-4.3, Welding Surveillance and Weld Procedure Assignment.

These procedures provide specific guidance for the erection, fabrication and inspection of QA structural steel material.

QC inspection form WBNP-QCP-2.4 "Steel Inspection Report", used to document erection and inspection of QA structural steel, requires fitup inspections without distinguishing between structural fitup and weld joint fitup. Presently the civil engineering unit (CEU), verifies structural alignment and location only and signs-off for fitup on the form. However, it could not be ascertained at this point whether fitup inspection from the standpoint of weld joint parameters was being performed and included in this sign-off as there was no objective evidence (records) to verify that this was being done. The licensee agreed to look into this matter and was advised that it would be an unresolved item assigned item number 78-05-03.

c. Review of Unit 1 Refueling Water Storage Tank (RWST) Radiographs

Radiographic examination of the RWST is performed by PDM in accordance with NDE procedure RT-10 Rev. 0. The procedure references Sections III and V of the ASME Code, 1974 Edition including the 1975 winter addenda as the application code. Randomly selected radiographs of completed horizontal and vertical welds, listed below, were examined for radiographic and film quality to determine whether they met applicable code and procedural requirements.

<u>Weld No.</u>	<u>RT Station</u>	<u>Comment</u>
1V7	5-6, 6-7	Slag indication between 6-7, acceptable
3V4	2-3	fogging, some streaks
4V3	3-4	_____
4V1	0-1	fogging

4V5	3-4, 4-5, 5-6	fogging
5V4	*2-3, 3-4	*requested reshot for lack of definition, could not see hole.
5V3	1-2	_____
4V3	4-5	film identification marker on pene, resting on edge of 4T hole. Some streaking.
4V4	5-6	_____
4V1	3-4, 4-5, 5-6	fogging on 5-6 station
4V2	3-4, 4-5	_____
4H3	14-15	_____
3H4X	4-5, 6-7	_____
3H1	2-3	_____
4H1	7-8	_____
4H2	19-20	_____
4H5	11-12	_____

The inspector noted that present film processing practices/ facilities preclude good film quality which, in many instances, makes it difficult to perform an accurate evaluation of some radiographs. The licensee and contractor agreed to evaluate existing facilities; and the contractor (PDM) agreed to reshot station 2-3 of field weld 5V4 above. The inspector informed the licensee that the above matters would be identified as an unresolved item and would be assigned item number 78-05-04.

d. Plant Tour - Units 1 and 2

The inspector walked through various areas of the plant to observe certain installation and welding activities in progress and to inspect the general state of cleanliness, including

control of unused weld electrode material at the work stations. Within these areas the inspector observed the following activity:

<u>Weld No.</u>	<u>ISO/DE No.</u>	<u>System</u>	<u>Comments</u>
2-062A-D009-03	D009	CVC	Weld ~ 3/4 complete.
1-001A-D006-05A	D006	M.S. Penetration	Fitup in progress.
MKE34P10 to P11	_____	Cask Loading Wash Pit	Weld ~ 80% complete.
#6-US-8-2, F0043	(Tang Plate)	Steam Generator SG, 3 Unit 2	Weld Prep and again at ~ 1/2 complete.

In addition, the inspector checked the completed welds of four tang plates, similar to the one above, located in the same area of SG3 in Unit 2. The inspection included weld appearance, workmanship and a review of QC weld inspection records.

In response to the inspector's request to review the QC weld inspection records for Tang Plate #6-US-8-2, SG3 in Unit 2 the licensee's cognizant engineer stated that there were no such QC records available. Moreover, he stated that the applicable Form "WBNP-QCP-2.4 Attachment A," would be generated after all welds in that group had been accepted following surface NDE examination. Therefore, there was no objective evidence to verify that the required process control and/or QC inspection had been performed on these welds.

This finding represents a violation to WBNP-QCP-2.4 Rev. 2, paragraph 5.3 which requires that all required inspections be made and documented. This is one of two (2) examples of failure to follow procedural requirements which is in non-compliance with Criterion V of Appendix B, to 10 CFR 50. This was identified as example 2 of the noncompliance assigned item number 78-05-01.

5. Containment (Structural Steel Welding) - Review of Quality Records, Units 1 and 2

Most of the major equipment supports arrived on site prefabricated, thereby requiring only a minimum amount of welding for final installation. Field fabricated welds were performed in accordance with AWS structural welding Code D1.1-72 or -74 as applicable. Inspection and/or NDE requirements were implemented through established procedures in TVA's Construction Specification G-29 or details delineated on design engineering drawings.

Supports where field welding, testing and inspection activities had been completed were randomly selected for a record review to determine whether the records were in conformance with established procedures and whether these records reflected work accomplishment consistent with applicable requirements. The welds selected were as follows:

a. Reactor Vessel Support Imbeds

<u>Unit 1</u>	<u>Unit 2</u>
37-1L1, -1L2	37-1L3, -1L4
37-1R1, -1R2	37-1R3, -1R4
38-1L1, -1L2	38-1L3, -1L4
38-1R1, -1R2	38-1R3, -1R4

b. Upper Pressurizer Supports - Unit 2

Mark 33-15-1, Angle modification, on nonconformance report NCR-988R, drawing No. ^{MV-15}48N419.

c. Structural Steel Restraints, SG-3 - Unit 2 on Dwg. No. 48N417 and 48N418.

For these welds, QC records were reviewed for completeness and accuracy and for information concerning visual and dimensional inspection weld history, thermal treatment, repair control of weld consumables, welder and inspector qualifications as applicable.

Within these areas, the inspector noted that weld fitup inspections had not been signed-off for the eight (8) Unit 1 reactor vessel support imbed welds on the appropriate document. Therefore, there was no objective evidence to verify that this inspection had been performed as required.

This finding represents a violation to WBNP-QCP-2.4 Rev. 2 which requires that all required inspections be made and documented. This is the second of two (2) examples of failure to follow procedural requirements which is in noncompliance with Criterion V of Appendix B, to 10 CFR 50. This was identified as example 1 to the noncompliance assigned item number 78-05-01.

6. Safety-Related Structures (Welding) - Review of Quality Assurance Implementing Procedures, Units 1 and 2

The refueling water storage tank (RWST) and primary water storage tank (PWST) are being erected by Pittsburgh Des Moines Steel Company (PDM) under contract with TVA. Design considerations are controlled by TVA's design specification No. WBNP-DS-1935-2726-R00 which lists, ASME Section III, 1974 Edition to and including Winter 1975 addenda, as the governing code. In addition, this document includes requirements for fabrication, installation inspection and testing activities as applicable. These requirements are implemented through PDM's QA Manual (QAM), "ASME Section III, Divisions 1 and 2 QA Manual for Nuclear Power Plant Components," which contains measures for implementing control over field activities including weld procedures, weld rod and welder qualification, nonconformance, corrective action, calibration, inspection, examination and testing of material and/or field welds. This manual was audited and approved by ASME on December 1977. Details on field welding are addressed in weld specification WS-40 for the RWST and WS-41 for the PWST. These specifications control materials, preparation, welding and inspection (NDE) and, reference ASME Sections V and IX as applicable to on-site welding and NDE activities.

PDM's Field Check List (FCL) is used to identify QC inspections, specific hold points imposed by the ANI and provide objective evidence that required inspection was conducted and witnessed by appropriate personnel.

Within the areas inspected, no items of noncompliance or deviations were identified.

7. Safety-Related Structures (Welding) - Observation of Work Activities
Unit 1

At the time of this inspection work on the RWST was near completion. The codes governing fabrication and testing are discussed in paragraph 6 of this report. Completed and partially fabricated welds were selected at random and examined to determine whether code and procedural requirements were being met. Welds selected for this effort were as follows: 3V11, 5V4, 3A5, 3A13, 1V2 and 1V1. For these welds the inspector verified weld identification, location, joint prep and alignment, use of specified weld procedure, welder performance qualifications, use of specified weld material, repairs as applicable, performance of NDE, (see paragraph 4.c of this report), and control and issue of weld consumables. In addition the inspector reviewed quality records for the following plate material and subassembly.

<u>Piece Mark</u>	<u>Heat No.</u>	<u>Side</u>
2E-2	25048	94
2E-3	19977	88
2E-4	19977	81

Subassembly

9D pipe penetration, PDM dwg #9 Rev. A.

QA and QC personnel assigned to this project were adequately qualified.

Within the areas inspected, no items of noncompliance or deviations were identified.

8. Exit Interview

The inspector met with the licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on February 16, 1978. The inspector identified the areas inspected. The licensee was advised that three unresolved items (paragraph 4.a, 4.b and 4.c) and one noncompliance (paragraph 4.d and 5) were identified. The licensee acknowledged the inspection findings.