



UNITED STATES  
 NUCLEAR REGULATORY COMMISSION  
 REGION II  
 101 MARIETTA STREET, N.W.  
 ATLANTA, GEORGIA 30323

Report Nos.: 50-390/84-79 and 50-391/84-53

Licensee: Tennessee Valley Authority  
 500A Chestnut Street  
 Chattanooga, TN 37401

Docket Nos.: 50-390 and 50-391

License Nos.: CPPR-91 and CPPR-92

Facility Name: Watts Bar 1 and 2

Inspection Conducted: October 23 - 26, 1984

Inspector:	<u>J. J. Blake</u>	<u>11/9/84</u>
	for W. P. Kleinsorge .	Date Signed
Approved by:	<u>J. J. Blake</u>	<u>11/9/84</u>
	J. J. Blake, Section Chief	Date Signed
	Division of Reactor Safety	

SUMMARY

Scope: This routine, unannounced inspection involved thirty inspector-hours on site in the areas of construction progress, scaffolding, external fluid pressure boundary cleaning, safety-related structures - observation of work and work activities (55063B) (Unit 2) and safety-related piping (welding) - observation of work and work activities (55083B) (Units 1 and 2).

Results: Two violations - "Failure to Establish Adequate Controls for Storage and Preservation of Piping Assemblies - paragraph 5a and "Failure to Establish Adequate Measures to Control NDE and Welding" - paragraphs 6a(1) and 7e(1).

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## REPORT DETAILS

### 1. Licensee Employees Contacted

- \*H. J. Fisher, Construction - Engineer
- \*S. Johnson, Quality Manager
- \*K. G. Galloway, Welding QC - Supervisor
- \*S. J. Boney, MEV-C-Supervisor
- \*T. L. Corden, WEV-Supervisor
- \*T. Hayes, NLV-Supervisor

Other licensee employees contacted included construction craftsmen, technicians, engineers, and office personnel.

NRC Resident Inspector

M. Shymlock

\*Attended exit interview

### 2. Exit Interview

The inspection scope and findings were summarized on October 26, 1984, with those persons indicated in paragraph 1 above. The inspector described the areas inspected and discussed in detail the inspection findings listed below. No dissenting comments were received from the licensee.

(Open) Violation 390/84-79-01, 391/84-53-01: "Failure to Establish Adequate Controls for Storage and Preservation of Piping Assemblies" - paragraph 5.a

(Open) Violation 390/84-79-02, 391/84-53-02: "Failure to Establish Adequate Measures to Control NDE and Welding" - paragraphs 6a(1) and 7e(1).

(Open) Unresolved Item 390/84-79-03, 391/84-53-03: "Skewed Weld Acceptance Criteria" - paragraph 6a(2).

(Open) Unresolved Item 390/84-79-04: "Code Case N-127 Records" - paragraph 7e(2).

(Open) Inspector Followup Item 390/84-79-05, 391/84-53-05: "Scaffolding" - paragraph 5b.

(Open) Inspector Followup Item 390/84-79-06, 391/84-53-06: "Chloride Swipe Testing" - paragraph 5c.

(Open) Inspector Followup Item 390/84-79-07, 391/84-53-07: "Management/Supervisory Appointed Inspectors" - paragraph 6b.

(Open) Inspector Followup Item 390/84-79-08, 391/84-53-08: "Liquid Penetrant Materials" - paragraph 7d.

3. Licensee Action on Previous Enforcement Matters

Not inspected.

4. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve violations or deviations. New unresolved items identified during this inspection are discussed in paragraph Nos. 6a(2) and 7e(2).

5. Independent Inspection Effort

a. Construction Progress

The inspector conducted a general inspection of the power block construction site and outdoors storage areas to observe construction progress and construction activities such as welding, material handling and control, housekeeping and storage.

With regard to the inspection above, the inspector noted the following in the outdoors storage areas:

- Approximately twenty five examples of safety-related piping assemblies off the curbing and in contact with the ground. The above is contrary to ANSI N45.2.2-1972, "Packaging, Shipping, Receiving, Storage and Handling of Items for Nuclear Power Plants (During the Construction Phase", paragraph Nos. 2.7.4.(9) and 6.1.2.(4) which require piping assemblies to be stored up on curbing to avoid trapping water.
- The approved tape for use on austenitic materials is silver gray in color, close to the color of austenitic stainless steel. The above is contrary to ANSI N45.2.2-1972, Appendix A.3.5.2(3) as amended by Regulatory Guide 1.38, paragraph C.2.d, which requires tape to be colored to contrast with materials on which they are used.

The above indicated that the licensee failed to establish adequate measures to control storage and preservation of piping assemblies. Failure to establish measures to control storage of materials and equipment to prevent damage is in violation of 10 CFR 50 Appendix B, Criterion XIII. This violation will be identified as 390/84-79-01, and 391/84-53-01: "Failure to Establish Adequate Controls for Storage and Preservation of Piping Assemblies.

## b. Scaffolding

The inspector selected three scaffolds, locations indicated below, and requested that the licensee provide a work release for each or demonstrate exemption as permitted by TVA QCI-1.07, Revision 10, "Work Release", paragraph 6.6.1.

## Location (Approximate)

10'E of A13 and 15'N of U  
10 feet above 713

10'E of A13 and 15'N of U  
15 feet above 713

Just Behind Locked gate in the  
Unit 2 pipe Chase on EL 713

Neither the work release nor the demonstration was forthcoming by the end of this inspection. The inspector indicated that pending NRC review of either the work release or the demonstration, this matter would be identified as inspector followup item 50-390/84-79-05 and 50-391/84-53-05: "Scaffolding".

## c. External Fluid Pressure Boundary Cleaning

The inspector looked into the cleaning practices prior to pipe covering and noted that the TVA Procedure WBNF-QCP-4.10-11 Revision 3, "External Cleaning" as implemented by TVA Process Specification 4.M.4.1(R), requires random swipe testing for chloride contamination on accessible nonwetted surfaces of austenitic stainless steel pressure boundary materials prior to covering. The inspector discussed the above with the licensee who indicated that there was no time limit between the testing and the covering. The inspector observed that as the time between the testing and the covering is increased, the validity of the testing is decreased. The licensee indicated that they would look further into the matter. The above will be identified as inspector followup item 390/84-79-06, and 391/84-53-06: "Chloride Swipe Testing".

Within the areas examined, no violations or deviations were identified except as noted in paragraph 5a.

## 6. Safety-Related Structures - Observation of Work and Work Activities (55063)(Unit 2)

The inspector observed field welding activities associated with safety-related structures and supports outside containment during various stages of weld completion. Observations were made in order to determine whether the requirements of applicable specifications, standards, work and/or inspection procedures are being met for the activities. The applicable code for the structures listed below is AWS D1.1.

- a. The inspector visually examined completed and accepted welds as described below to determine whether applicable code and procedure requirements were being met.

Welds on the below listed structures were examined relative to the following: location, length, size and shape; weld surface finish and appearance transitions between different wall thicknesses; weld reinforcement -- height and appearance; joint configuration of permanent attachments and structural supports; removal of temporary attachments; arc strikes and weld spatter; finish-grinding or machining of weld surface -- surface finish and absence of wall thinning; surface defects -- cracks, laps, and lack of penetration, lack of fusion, porosity, slag, oxide film and undercut exceeding prescribed limits.

Pipe Support Nos.

74-2RHR-R21  
 74-2RHR-R91  
 A450-3-37  
 A431-11-33  
 555-7-7A-2218  
 555-7-1-2230  
 560-1-28-4240  
 555-7-4-2300  
 555-7-40-13

- (1) With regard to the examination above, the inspector noted an undersize weld on pipe support 1062-555-7-40-13. The licensee confirmed the findings and documented the same in NCR-5844-Rev. 0. Therefore, the welder of record for the pipe support in question failed to deposit a proper size fillet weld, and the inspector of record failed to identify the rejectable undersize weld and accepted the pipe support as is. The above indicates inadequate control of special processes (NDE), and is an example of Violation 438/84-79-02 and 439/84-53-02, discussed further in paragraph 7e(1).
- (2) With regard to the examination above, the inspector noted that there was no weld size specified, for the skewed weld connecting the 3"x3"x $\frac{1}{4}$ " tube steel to the 4"x4"x $\frac{1}{4}$ " tube steel, at an angle of approximately 27°, on the applicable drawings for pipe support No. 555-7-40-13. The only weld size specified on the drawings (other than those to unistrut) for the above support was a  $\frac{1}{4}$ " fillet weld connecting the base plate to the 4"x4"x $\frac{1}{4}$ " tube steel. The licensee stated that a note to a general pipe support drawing indicated that similar welds on the same support would be the same size. On this basis, the licensee postulated that the weld in question was accepted. The inspector made the following observations concerning the weld in question:

- The weld in question is not a fillet weld and the weld with size specified is a fillet weld. Therefore, the two welds are not similar.
- The weld in question does not conform to G29C-0.C.1.1.(RO) of 11/30/83, Sheet 21 of 21, R1. "Figure 9.3 - Alternate Fillet Weld All Around Connection for Members Meeting at an Angle". It should be noted that the above document post-dates the inspection of the support in question.

The licensee indicated that they would look further into the matter and determining the following:

- The Visual Acceptance Criteria at the time of the weld acceptance.
- Whether the (TVA) inspector of record, correctly accepted the weld in question.
- The Acceptance Criteria applicable at the time of this inspection.
- The Acceptance of this weld and support at the time of this inspection.

Pending NRC review of the licensee's determination of the above, this matter will be identified as unresolved item 390/84-79-03 and 391/84-53-03: "Skewed Weld Acceptance Criteria".

- b. The inspector reviewed the qualification records for the below listed structural welding inspectors.

Inspector

GSC  
CRB  
GHB  
WS  
KWL  
LRD  
JCC  
CRK  
TMH  
TL

With regard to the examination above, the inspector noted that 2.1.A.2 of Section III, Revision 1, of the Quality Assurance Training Program Plan permits responsible management/supervisory personnel who direct the performance of final visual inspections of structural welds may, on occasion, perform and document these activities if they are certified

by a letter from management who appointed them to the position of inspection supervisor. At the time of this inspection, it could not be determined how the qualification for final visual inspection of structures by management/supervisory personnel was verified and whether the eye examination requirements that are required by the TVA QA program for inspectors also applies to "management/supervisory appointed inspectors". The licensee indicated that they would look further into the matter. The above will be identified as inspector followup item 390/84-79-07 and 391/84-53-07: "Management/Supervisory Appointed Inspectors".

Within the areas examined, no violations or deviations were identified except as noted in paragraph 6a(1).

7. Safety-Related Piping (Welding) - Observation of Work and Work Activities (55083B) (Units 1 and 2)

The inspector observed field welding of safety-related piping outside the reactor coolant pressure boundary at various states of weld completion. The applicable Code for safety-related pipe welding is ASME B&PV Code Section III, Subsection NC and ND 1971 Edition with addenda through Summer 1973.

- a. The inspector examined weld joint fitup, prior to welding, to determine whether weld identification/location, joint preparation and alignment, and evidence of QC verification meet applicable procedures. The following weld joints were examined.

<u>Joint Number</u>	<u>Isometric</u>	<u>System</u>
2-003C-154-02	W-2-003-EN, R3	Feedwater
2-015-T013-05	400-7, Sh 3B, R2	Steam Blowdown
2-067C-T554-18	450-21, Sh 2-2, R1	ERCW

- b. The inspector examined weld joints where the root pass (only) had been completed to determine: weld/welder identification, use of qualified welder/weld procedure, physical appearance of weld and evidence of QC verification. The following weld joints were examined.

<u>Joint Number</u>	<u>Isometric</u>	<u>System</u>
2-067C-T400-25	450-25, Sh 2, R4	ERCW
2-003-154-02	W-2-003-EN, R3	Feedwater
2-015-T013-05	400-7, Sh 3B, R2	Steam Blowdown
2-067C-T554-18	450-21, Sh 2-2, R1	ERCW

- c. The inspector examined weld joints of pipe to pipe/fitting (PPF) and pipe to components (PC) where welding was beyond the root pass to determine: weld/welder identification, use of qualified welder/weld procedure, periodic checks of welding variables, use of specified weld material, proper interpass temperature and (where applicable) pre-heat and post-weld heat treatment, and physical appearance of weld (e.g., starts, stops, undercut and surface imperfections).

<u>Joint Number</u>	<u>Type</u>	<u>Isometric</u>	
2-067C-T405-19D	PPF	450-27, Sh 7, R2	ERCW
2-067C-T400-25	PPF	450-25, Sh 2, R4	ERCW
2-003C-154-02	PPF	W-003-EN, R3	Feedwater
2-003C-154-02A	PPF	W-003-EN, R3	Feedwater
2-003C-154-02B	PPF	W-003-EN, R3	Feedwater
2-003C-154-05	Pipe to Pipe	W-003-EN, R3	Feedwater
2-015-T013-05	PPF	400-7, Sh 3B, R2	Steam Blowdown

- d. The inspector examined the following welds where non-destructive testing (NDE) was in progress to determine; surface suitability, specified NDE being performed and with qualified personnel.

<u>Joint Number</u>	<u>Isometric</u>	<u>System</u>
2-068A-T001-21	465-1, Sh 2-2, R1	Reactor Coolant
2-068A-T001-23	465-1, Sh 2-2, R1	Reactor Coolant
2-068A-T002-23	465-1, Sh 2-3, R1	Reactor Coolant
2-068A-T002-25	465-1, Sh 2-3, R1	Reactor Coolant

With regard to the examination above, the inspector noted that TVA Procedure WBNP-QCP-4.13-PTM, Rev. 1, "Liquid Penetrant Examination", Appendix A specifies Spot Check, Magnaflux Type SKC-S or SKC-NF as the only Spot Check, Magnaflux authorized cleaner. The examination above was performed with Magnaflux Type SKC-NF/ZC-7B. The inspector discussed the above with the licensee, who indicated that they would provide documented evidence of the equivalency of Type SKC-NF with SKC-NF/ZC-7B or perform qualification testing for the use of the type SKC-NF/ZC-7B. In addition, the licensee indicated that they would amend WBNP-QCP-4.13-PTM to reflect all Liquid Penetrant Materials in use on the site. Pending the licensee's completion of the above, this matter will be identified as inspector followup item 390/84-79-08, and 391/84-53-08: "Liquid Penetrant Materials".

- e. The inspector reviewed records of the below listed, completed and accepted weld joints, welded with the automatic gas tungsten arc welding process (ASTROARC) and inspected with the liquid penetrant method in lieu of radiography as permitted by ASME B&PV Code, Section III Code Case N-127 of February 14, 1983, to determine; weld/welder identification, use of qualified welder/weld procedure, periodic checks of



welding variables, use of specified weld material, proper interpass temperature and where applicable pre-heat and post-weld heat treatment and physical appearance of weld (e.g., starts, stops, undercut and surface imperfections).

<u>Weld No.</u>	<u>Isometric</u>
1-043-T039-08	625-11 Sh 183 P1 Rev. 3
1-043-T039-09	625-11 Sh 183 P1 Rev. 3
1-043-T039-10	625-11 Sh 183 P1 Rev. 3
1-043-T039-11	625-11 Sh 183 P1 Rev. 3
1-043-T039-12	625-11 Sh 183 P1 Rev. 3
1-043-T039-13	625-11 Sh 183 P1 Rev. 3
1-043-T039-14	625-11 Sh 183 P1 Rev. 3
1-043-T040-08	625-11 Sh 182 P1 Rev. 4
1-043-T040-09	625-11 Sh 182 P1 Rev. 4
1-043-T040-10	625-11 Sh 182 P1 Rev. 4
1-043-T040-11	625-11 Sh 182 P1 Rev. 4
1-043-T040-12	625-11 Sh 182 P1 Rev. 4
1-043-T040-13	625-11 Sh 182 P1 Rev. 4
1-043-T040-14	625-11 Sh 182 P1 Rev. 4

- (1) With regard to the examination above, the inspector noted that the sampling system was welded, in part, with Detail Welding Procedure No. GTA-88-S-2, Revision 3, supported by Procedure Qualification Record GTA-88-S-2. The welds above were inspected by the liquid penetrant method as an alternate to radiography as authorized by ASME Code Case N-127 dated February 14, 1983. Welding procedure specification GTA-88-S-2 specified a welding travel speed range that varied by more than  $\pm 10\%$  of the value recorded in Procedure Qualification Record GTA-88-S-2. The above is contrary to ASME Code Case N-127 dated February 14, 1983, paragraph 5, which requires that the production welding travel speed not vary more than  $\pm 10\%$  from the procedure qualification welding travel speed. In view of the above, it cannot be assured that the sampling system was welded within the parameters required by Code Case N-127.

The above is an example of inadequate control for special processes (Welding). The above example combined with that discussed in paragraph 6a(1) indicate that the licensee failed to establish adequate measures to assure that special processes including nondestructive examination and welding, are controlled. Failure to establish measures to assure that special processes are controlled is in violation of 10 CFR 50, Appendix B, Criterion IX. This violation will be identified as 390/84-79-02 and 391/84-53-02: "Failure to Establish Adequate Measures to Control NDE and Welding".

(2) With regard to the examination, the below listed documents were not available at the time of this inspection:

- Records of mockup welding (preproduction welding and after four hours) including time of start and stop of production welding, as required by Code Case N-127, paragraph 4.0.
- Code data report indicating, Code Case No. N-127 and applicable revision as required by Code Case N-127, paragraph 10.0.

The inspector stated that pending NRC review of the above, the matter will be identified as unresolved item 50-390/84-79-04: "Code Case N-127 Records".

- f. The inspector observed activities at weld material issue stations to determine adequacy of: weld material storage/segregation, oven temperatures, issue records and return of unused weld material. Also observed work areas of uncontrolled weld material.

Within the areas examined, there were no violations or deviations identified except as noted in paragraph 7e(1).