



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

Report Nos.: 50-390/86-09 and 50-391/86-09

Licensee: Tennessee Valley Authority
 6N38 A Lookout Place
 1101 Market Street
 Chattanooga, TN 37402-2801

Docket Nos.: 50-390 and 50-391

License Nos.: CPPR-91 and CPPR-92

Facility Name: Watts Bar 1 and 2

Inspection Conducted: March 31 - April 4, 1986

Inspector: *[Signature]*
 W. P. Kleinmorge

4/25/86
 Date Signed

Approved by: *[Signature]*
 J. J. Blake, Section Chief
 Engineering Branch
 Division of Reactor Safety

4/25/86
 Date Signed

SUMMARY

Scope: This routine, unannounced inspection involved 40 inspector-hours on site in the areas of housekeeping (54834B), material identification and control (42902B), material control (42940B), welder performance renewal (55050) (55100) (Units 1 and 2), Safety-related heating ventilating and air conditioning (HVAC) systems (50100) (Unit 1), reactor coolant pressure boundary piping - observation of work activities (49054B) (Unit 2), safety related piping - review of quality records (55085B) (Unit 2), and inspector followup items (92701B).

Results: No violations or deviations were identified.

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REPORT DETAILS

1. Persons Contacted

Licensee Employees

- G. Wadewitz, Construction Project Manager
- *T. Hayes, Nuclear Licensing Unit Supervisor
- *K. Galloway, Construction Staff
- *S. Stagnolia, Supervisor of Welding Engineering Staff,
Office of Construction
- *K. Hastings, Supervisor Welding Unit

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

NRC Resident Inspectors

- M. Shymlock, SRI Operations
- G. Walton, SRI Construction
- W. Holland, RI
- *C. Caldwell, RI

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on April 4, 1986, with those persons indicated in paragraph 1 above. The inspector described the areas inspected and discussed in detail the inspection findings. No dissenting comments were received from the licensee. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection.

(Open) Unresolved Item 50-390, 391/86-09-01: "Misexamination of Welds" - paragraph 6.

(Open) Unresolved Item 50-390, 391/86-09-02: "Radiographic Density" - paragraph 9.

3. Licensee Action on Previous Enforcement Matters (92701B) (92702B)

This subject was not addressed in the inspection.

4. Unresolved Items

Unresolved items are matters which more information is required to determine whether they are acceptable or may involve violations or deviations. Two new unresolved items identified during this inspection are discussed in paragraph nos. 6 and 9.

5. Independent Inspection Effort

Housekeeping (54834B), Material Identification and Control (42902B) and Material Control (42940B)

The inspector conducted a general inspection of Unit 2 construction area including containment, auxiliary, and turbine buildings to observe activities such as housekeeping, material identification and control; material control, and storage.

Within the areas examined, no violations or deviations were identified.

6. Welder Performance Renewal (55050) (55100)

As a result of employee concerns related to the validity of the licensee's implementation of their program for maintenance of welder and welder operator qualification, the licensee suspended all welding operations on August 23, 1985, documented in NRC Confirmation of Action letter of the same date because of a lack of evidence that welder and welder operator qualification had not expired. As of August 23, 1985, there were approximately 570 certified welders on site of which approximately 30 welders had taken original qualification tests within 90 days prior to August 23, 1985. These 30 welders were considered to be still qualified but the remaining would have to be given a qualification renewal test consistent with ASME Section IX paragraph QW-322 or AWS D1.1-1985, paragraph 5.30.

On August 29, 1985, an inspection of in-process renewal testing was made at the Watts Bar site and is reported in NRC Reports 50-390/85-52 and 50-391/85-42. Additional inspections were made at the Watts Bar site during the periods November 4-7, and November 13-15, 1985, to review TVA's corrective actions prompted by employee concerns on welder performance qualification renewals at Watts Bar Nuclear Plant (WBNP). This inspection is reported in NRC Reports 50-390/85-62 and 50-391/85-51.

To date, the licensee has tested 534 office of construction (OC) welders, of which 414 passed the first attempt (77.5%). One hundred twenty failed (22.5%). A retest was administered to the 120 who failed the first attempt, of which 83 passed and 37 failed (19% of the original 534). TVA has put the 83 welders who failed the first test and passed the retest back to work welding. TVA is keeping a record of all the welding both safety-related and non safety-related performed by those 83 welders for later action pending the resolution of Unresolved Item 50-390/85-62-01, 50-391/85-51-01.

The validity of the retest administered to the 120 original welder failures is discussed in reports 50-390/85-62 and 50-391/85-51. As of this inspection, the inquiry submitted to ASME Code Committee by TVA has been answered by P. D. Strumpt, Assistant Secretary, Boiler and Pressure Vessel Committee as indicated below.

Question: A welder or welding operator's qualification for a process has expired because he has not welded within the time periods required by QW-322 (a) and (b). There is no specific reason to question his ability to make welds that meet the specification. Does QW-322 prohibit the use of QW-321 for retest of qualification where a welder has failed the single renewal test joint as provided by the last sentence of QW-322?

Reply: No."

NRR has sent the below inquiry to ASME Section IX Committee, but as of this inspection NRR has not received an answer.

"Subject: Section XI, QW, 320

Question (1): If a welder or welding operator fails to pass the Renewal of Qualification test of QW-322 does the failure constitute "a specific reason [under QW-322(c)] to question his ability to make welds that meet the specification"?

Suggested Reply: Yes

Subject: Section IX, QW-300 and QW-320

Question (2): The manufacturer, authorized nuclear inspector, or the regulatory body has a specific reason to question the ability of a welder or welding operator to make acceptable welds.

Part (1): In order to demonstrate his capability to make welds that meet the specification, does the Code permit use of the "Renewal of Qualification" test of QW-322?

Suggested Reply: No

Part (2): In order to demonstrate his capability to make welds that meet the specification, does the Code require qualification tests in accordance with QW-301?

Suggested Reply: Yes"

The licensee determined that the problem of improper welder qualification performance renewal occurred during the period of October 1, 1984 to August 23, 1985.

The licensee has performed record reviews to develop two group populations. Group No. 1 was composed of the 120 welders who failed the first renewal test plus four welders that were not tested due to transfer or termination, for a total of 124 welders. Record review for those 124 welders during the above period showed that only 59 welders welded a total of 2561 ASME Section III (safety-related) welds with 18 inspection rejects for a reject

rate of 0.70%. The remainder, if they welded, welded on AWS structures or non safety-related work neither of which require the generation of, or, maintenance of records identifying welders with welds. To define the second group population the licensee searched the computer records for all safety ASME Section III welds made during the above period (10,427 welds made by 223 welders) for welders who had a lapse of time between ASME Section III welds of more than 90 days. TVA identified 34 welders who welded 385 welds after a lapse of 90 days. Group No. 1 population was 2561 welds. Group No. 2 population was 385.

The licensee took a random sample of 69 welds from Group No. 1 and 72 welds from Group No. 2 and performed a reexamination to original acceptance criteria. The examinations consisted of 69 visual examinations (VT), 44 liquid penetrant examinations (PT) and 2 magnetic partial examinations (MT) for Group 1 and 72 VT, 28 PT and 8 MT examinations for Group 2. The results of the reexamination are as follows: Group 1-3 VT rejects and 1 VT-PT rejects, and Group 2-8 VT rejects. After engineering analysis all but the one VT-PT rejects were determined to be acceptable "use-as-is" for Group 1 and all but two VT-rejects were determined to be acceptable "use-as-is" for Group 2. The three remaining welds are still under engineering evaluation which the licensee committed, in their March 12, 1986 letter to NRC, to be completed by May 1, 1986. Of the twelve reexamined welds rejected, nine should have been rejected at the time of the original acceptance examination.

In addition to the above review, approximately 568 office of construction welders at the Watts Bar site, there are 9 nuclear power welders on site. Those 9 welders were also given a renewal test and 8 passed; one failed. The licensee stated that the safety-related work of the failed welder was examined and found acceptable. The failed welder was retested and passed the second test.

This inspector conducted numerous interviews with licensee personnel; examined inspection records, procedures, engineering evaluations of rejected reexamination welds, and licensee and TVA correspondence; and performed physical examinations of some welds in the two group populations to assess Watts Bar's corrective actions pursuant to the August 23, 1985 confirmation letter on welder qualification. The inspector has the following findings with regard to above assessment:

- All evaluations to date have been made on ASME welds only, because the ASME welds are the only welds that have welder related records. TVA stated in their October 29, 1985 letter to the NRC in Enclosure 1, Clarification V, "TVA will determine if welder continuity history for welders performing ASME code welds can be used for evaluating the adequacy of Non-ASME Code welds. The results of the above and statistical weld rejection and renewal test failure trends will be used to evaluate the adequacy of

Non-ASME Code welds not requiring welder identification documentation. The approach and results of the determination and evaluation will be provided to the NRC." To date the approach and results have not been provided to the NRC.

- No pattern of poor welder performance that could be tied to improper welder performance renewal practices has yet been identified.
- Of the 141 (69 + 72) welds reexamined nine examples were identified, by TVA, that were rejectable at the time of the original examination. TVA is currently evaluating this misexamination. Pending NRC review of TVA completed evaluation this matter will be identified as Unresolved Item 50-390,391/86-09-01: "Misexamination of Welds".
- TVA's correspondence to NRC dated September 11, 1985, September 30, 1985, October 29, 1985, January 24, 1986, and March 12, 1986, is disjointed and conflicting and does not present a clear concise description of the circumstances relating to the determination of the extent of the problem, the evaluation plan and schedule, the corrective measures taken and planned, and the results obtained and the expected schedule for completion. The orderly inspection and closeout process necessitate clarification of disjointed and confusing TVA correspondence related to this matter.

In conclusion, the licensee has followed an orderly and conservative path to evaluate the concern over improper welder performance qualification renewal in the area of ASME welding. To date, Non ASME welding has not been addressed. No indication of poor welder performance related to improper welder renewal practices has been identified; however, nine examples of misexamination of welds were identified. Although the licensee has followed an orderly path in the evaluation of this matter, the same cannot be said for the licensee's correspondence to the NRC concerning this matter.

Within the areas examined, no violations or deviations were identified.

7. Safety-Related Heating Ventilating and Air Conditioning (HVAC) Systems (50100) (Unit 1)

The inspector reviewed a sample of safety-related HVAC system records indicated below to determine whether the licensee is adequately preparing, reviewing, and maintaining a system of quality records; whether the records reflect work accomplished consistent with NRC requirements and SAR commitments; and whether the record indicate any potentially generic problems, management control inadequacies, or other weakness that could have safety significance.

The inspector reviewed documentation for charcoal filter medium to verify conformance to the applicable portion of Regulatory Guide 1.52.

Within the area examined, no violations or deviations were identified.

8. Reactor Coolant Pressure Boundary Piping - Observation of Work and Work Activities. (49054B) (Unit 2)

The inspector, by direct observation, performed an independent evaluation, as described below, of work performance on completed work, to ascertain whether activities relative to reactor coolant pressure boundary piping, (except welding) had been accomplished in accordance with NRC requirements and SAR commitments.

The inspector compared the as-built/final design drawings listed below with the actual installation to determine whether TVA has properly controlled and documented final as-built drawings. Specific attention was given to the ASME Class 1 portion of piping inside the crane wall depicted on the below listed drawings.

Drawings

SK-465-1	Sheet 2-28	R2
SK-465-6	Sheet 2-4	R6
WBN-E-2882-IC-197		R8
WBN-E-2882-IC-196		R4
WBN-E-2882-IC-136		R4

Within the areas examined, no violations or deviations were identified.

9. Safety-Related Piping-Review of Quality Records (55085B) (Units 2)

The inspector reviewed quality records relative to welding of safety-related piping outside the reactor coolant pressure boundary described below, to ascertain whether these records reflect work accomplishment consistent with NRC requirements and SAR commitments.

The below listed radiographs were examined:

2-063B-D197-01G*
 2-063B-D196-01E*
 2-062B-D136-07A
 2-062B-D136-07
 2-074B-D023-01
 2-074A-D026-02
 2-063B-D190-07
 2-063A-D121-11C1
 2-062A-D006-05
 2-062A-D009-01

With regard to the inspection above, the inspector noted that the radiographs marked had a density of 4.2 to 4.4 in a significant portion of the area of interest. The procedure used to evaluate the indicated radiographs does not specify a maximum density for radiographs, which is consistent with ASME, Section V 71S73, Article 3, paragraph T-320(b). ASME, Section V 71S73, Article 2, paragraph T-233, limits film density to 3.8 maximum. At the time of this inspection, the licensee was unable to provide justification for the use of ASME Section V 71S73, Article 3 density provisions. Pending NRC review of the licensee's justification, this matter will be identified as Unresolved Item 50-390,391/86-09-02: "Radiographic Density."

Within the areas examined, no violations or deviations were identified.

10. Inspector Followup Items

(Open) Item 50-390/85-52-03 and 50-391/85-42-03: "Positive Identification of Welders and Welding Operators"

Procedure QCI-4.02, Revision 7, "Welder and Welding Operator Performance Qualification" has been revised to include a requirement to assure positive welders or welding operator identification. QCI 4.02 is the office of construction procedure for welder and welding operator performance qualification. The requirement for positive identification welders and welding operators is not included in procedure AI-9.4, Rev.1-31-86, "Welders Qualification and Continuity Program," the plant operations procedure for the same activity. The licensee indicated that they would make the necessary corrections to A I-9.4 to require positive identification. Pending NRC review of that change, this matter remains open.