



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 REGION II
 101 MARIETTA ST., N.W., SUITE 3100
 ATLANTA, GEORGIA 30303
 NOV 15 1979

Report Nos. 50-390/79-37 and 50-391/79-31

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

Facility Name: Watts Bar Nuclear Plant

Docket Nos. 50-390 and 50-391

License Nos. CPPR-91 and CPPR-92

Inspection at Watts Bar Site near Spring City, Tennessee and at licensee's Corporate Office and Singleton Laboratory near Knoxville, Tennessee

Inspector: E. H. Girard 11/9/79
 E. H. Girard Date Signed

Approved by: A. R. Herdt 11/13/79
 A. R. Herdt, Section Chief, RCES Branch Date Signed

SUMMARY

Inspection on September 28-29 and October 2-5, 1979

Areas Inspected

This routine, unannounced inspection involved 36 inspector-hours on site in the areas of open items (Units 1 and 2), Potential 50.55(e) Report of September 25, 1979, (Units 1 and 2), observation of reactor coolant pressure boundary piping work (Unit 2), and observation of safety related piping work (Unit 2).

Results

No items of noncompliance or deviations were identified.

DETAILS

1. Persons Contacted

Licensee Employees

- T. B. Northern, Project Manager - WBNP (Watts Bar Nuclear Plant)
- *H. C. Richardson, Construction Engineer - WBNP
- *S. Johnson, Assistant Construction Engineer - WBNP
- *R. L. Heatherly, QC&R Unit Supervisor - WBNP
- *J. M. Lamb, Mechanical Engineering Unit Supervisor - WBNP
- L. C. Northard, Welding Engineering Unit Supervisor - WBNP
- W. Barnes, Mechanical Engineer - WBNP
- J. F. Smally, Mechanical Engineer - WBNP
- G. E. Vest, Mechanical Engineer - WBNP
- G. Bonine, Mechanical Engineer - WBNP
- R. M. Jessee, Supervisor, Welding & Materials Engineering -
Engineering Design (EnDes)
- E. A. Merrick, Metallurgical Engineer - EnDes
- P. Guthrie, Supervisor Mechanical Engineering - Singleton Materials
Engineering Laboratory
- L. Hebert, QA Staff - OEDC (Office of Engineering Design and Construction)

NRC Resident Inspector

B. J. Cochran

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on October 5, 1979, with those persons indicated in Paragraph 1 above. Infraction 390/79-25-01 and 391/79-21-01, Potential 50.55(e) Report of September 25, 1979, and the unresolved item described in Paragraph 6 below were discussed.

3. Licensee Action on Previous Inspection Findings

(Closed) Infraction (390/79-09-01; 391/79-07-01): Chemical Volume Control System Holdup Tanks girth welds have reinforcement exceeding the ASME Code maximum. Tennessee Valley Authority's (TVA) responses dated April 11, May 23 and October 5, 1979, have been reviewed and determined acceptable by Region II. The inspector held discussions with the Assistant Construction Engineer and the Quality Control & Records (QC&R) Unit Supervisor and examined the corrective actions as stated in the letter of response. The inspector concluded that the licensee had taken all necessary actions with regard to this matter.

(Open) Infraction (390/79-25-01; 391/79-21-01): Omitted liquid penetrant inspection and documentation of alignment bead. TVA's letter of response

dated July 31, 1979, has been reviewed by Region II. The inspector held discussions with the Mechanical Engineering Unit Supervisor and other Mechanical Engineering Unit personnel regarding implementation of the corrective action and the action to preclude recurrence. During the discussion the inspector asked licensee personnel to describe the process through which all alignment bead welds requiring corrective action would be identified. The inspector was informed that the need for corrective action on such welds was being determined during a review of the operation sheets for the entries required to authorize such welds. The inspector was also informed, however, that this would not result in corrective actions for all such welds, as in the past some craft personnel had performed such welds unauthorized and undocumented. The inspector requested the licensee to provide a supplemental response to original letter of response indicating his resolution of the unauthorized and undocumented welds.

4. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve noncompliance or deviations. A new unresolved item identified during this inspection is discussed in Paragraph 6.

5. Independent Inspection

a. Potential 50.55(e) Report of September 25, 1979

The subject report addressed pipe that appeared to have been improperly annealed by the manufacturer (Sandvik, Inc.). All of the pipe questioned was 3/4 inch Sch 160 SA-376 Type 304, heat number 434248. It was purchased to comply with ASME Section III (71 S73). Part of this pipe was purchased to Class 1 Code requirements and the remainder to Class 2 requirements. The apparent problem, improper annealing of the pipe material, was detected through hardness measurements made as part of the licensee's qualification testing (per TVA Specification 4.M.1.2(d)) of a pipe bending procedure. The TVA specification required that the maximum surface hardness for bent piping samples not exceed Rockwell B (RB) 94 unless approved on a case basis by TVA's Engineering Design (EnDes). Rockwell B hardnesses determined on bend samples for the 3/4 inch heat 434248 pipe ranged from 91 to 102, varying with position around the bend. As a step in evaluating the pipe after finding the high hardness the licensee severely flattened a sample, a procedure which produced some small cracks in the pipe surface. (This was not a standard ASTM test.) On the basis of this information the licensee then hypothesized that the pipe had been improperly heat treated and notified Region II. The licensee continued his evaluation of the pipe performing the following additional tests:

- (1) Chemical analysis

- (2) Hardness across the material thickness
- (3) Hardness on unbent pipe sample ID and OD
- (4) Metallographic examination
- (5) Corrosion tests - ASTM A262 Practice A and E
- (6) Flattening test per SA-376
- (7) Check for change in hardness on a sample after solution annealing for 15 minutes at 1950 F and water quenching
- (8) Hardness measurements on samples of other type 304 pipe from Watts Bar
- (9) Penetrant inspection of bends for evidence of cracks

The licensee informed Region II that these tests showed the pipe to have only a high surface hardness which was postulated to have been caused by a final straightening of the pipe after annealing. The pipe manufacturer confirmed this as the probable source of the high surface hardness. The licensee stated that the corrosion tests and metallographic examination indicated that the annealing was adequate (no evidence of sensitization) and that penetrant examination of sample bends showed no evidence of cracking. Based on the tests the licensee concluded that the pipe was satisfactory for the intended applications.

The NRC inspector reviewed the data generated in these tests with test laboratory and other licensee engineering personnel and examined the test samples. The licensee's data and evaluation records relative to the questioned piping were examined for compliance with Code and Regulatory requirements. Samples of the subject pipe have been obtained from the licensee for independent NRC evaluation. The licensee has determined that this item is not reportable under 10 CFR 50.55(e).

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

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

The inspector examined a run of installed reactor coolant pressure boundary piping in the Reactor Heat Removal System for compliance with the configurational requirements depicted on the applicable drawing. The code applicable to this piping is ASME Section III C1.1(71 S 73). The piping run was traced from the Loop 4 hot leg to valves 2-FCV-74-2 and 2-FCV-74-9. This piping is depicted on drawing E2882-IC-31 R5. Prior to his examination of this piping, the inspector was informed by licensee MEU personnel that some

installed piping (though not necessarily that selected for examination by the inspector) would not meet tolerance requirements stated in Section 2.14 of TVA Specification G43 R4. The inspector discussed this with the Mechanical Engineering Unit (MEU) Supervisor and questioned the intent of the tolerance requirement in Specification G43, which states "Pipe centerline elevations and horizontal centerline dimensions shall be within $\pm 1/2$ -inch of the dimensions specified on the design drawing. This tolerance may be increased to ± 2 inches at specific locations to avoid interferences, or accommodate building or fabrication tolerances."

The inspector asked the MEU supervisor to obtain and provide to Region II a design engineering interpretation of the above requirement indicating where the $\pm 1/2$ -inch tolerance was meant to be applied. The MEU Supervisor acknowledged that some piping would not meet location tolerance requirements but indicated that the out-of-tolerance conditions would be caught during hanger installation. The inspector informed the licensee that the question of proper pipe location would be an unresolved item, identified as item 390/79-37-01 and 391/79-31-01, Pipe Located Within Intended Tolerances.

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

7. Safety-Related Piping - Observation of Work & Work Activities (Unit 2)

The inspector examined two runs of installed safety related piping outside the reactor coolant pressure boundary for compliance with configurational requirements depicted on the applicable drawings. The runs examined and the applicable drawings and codes are as follows:

- (1) Run: RHR piping from valves 2-FCV-74-2 and 2-FCV-74-9 to RHR pumps A and B

Drawings: E2882-IC-24 R2 and -25R2

Code: ASME Section III C1.2 (71S73)

- (2) Run: Spent Fuel Pool Cooling & Cleaning System from pump B inlet to the pool

Drawing: 47W855 - 1 R6

Code: ASME Section III C1.3 (71S 73)

The question of pipe location tolerances as described in Paragraph 6 above also applies to this piping.

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