



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

MAY - 9 1980

Report Nos. 50-390/80-10 and 50-391/80-07

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

Facility Name: Watts Bar

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 offices in Chattanooga, Tennessee

Inspectors:	<u>J. L. Coley</u>	<u>May 8, 1980</u>
For E. H. Girard		Date Signed
	<u>J. L. Coley</u>	<u>May 8, 1980</u>
		Date Signed
Approved by:	<u>A. R. Herdt</u>	<u>5/8/80</u>
	A. R. Herdt, Section Chief, RCES Branch	Date Signed

SUMMARY

Inspection on April 8-11, 1980

Areas Inspected

This routine, announced inspection involved 54 inspector-hours on site in the areas of Licensee action on previous inspection findings (Units 1 & 2), preservice inspection (Units 1 & 2), welding records for reactor coolant pressure boundary piping (Unit 1), records for safety-related piping (Units 1 & 2) and worker concerns (Units 1 & 2).

Results

No items of noncompliance or deviations were identified.

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DETAILS

1. Persons Contacted

Licensee Employees

- *J. E. Wilkins, Project Manager - WBNP (Watts Bar Nuclear Plant)
- *H. C. Richardson, Construction Engineer - WBNP
- *R. L. Heatherly, QC&R Unit Supervisor - WBNP
- *J. A. Thompson, Welding Engineering Unit (WEU) Supervisor - WBNP
 - S. Bonney, Engineering Associate - WBNP
 - R. Reed, Engineering Associate - WBNP
 - L. Harris, Mechanical Engineer - WBNP
 - W. Tyree, Mechanical Engineer - WBNP
 - R. H. Daniels, Supervisor, Baseline & Inservice Inspection - Div. of Power
- *M. Gothard, Mechanical Engineer, Baseline & Inservice Inspection -
Div. of Power
- *D. Harvey, Engineering Associate, Baseline & Inservice Inspection -
Div. of Power
- G. Belew, Mechanical Engineer, Metallurgy & Standards Group - Div. of Power

Other Organizations

- A. L. Hogarth, Westinghouse NSD Site Manager, Watts Bar site
- B. Eltzroth, Westinghouse NSD Site Systems Engineer, Watta Bar site

NRC Resident Inspector

- *T. Heatherly
- *J. McDonald

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on April 11, 1980 with those persons indicated in Paragraph 1 above.

3. Licensee Action on Previous Inspection Findings

(Closed) Unresolved Item (391/79-38-02): Unavailable radiographs.

The previously unavailable radiographs were provided by the licensee. The radiographs were reviewed by the inspector to verify compliance of film and weld with ASME Section III requirements. This item is closed.

(Open) Unresolved Item (390/79-37-01; 391/79-31-01): Pipe located within intended tolerances. Licensee Mechanical Engineering Unit (MEU) personnel informed the NRC inspector that new procedures were being developed for pipe location verifications. This item will remain open pending Region II verification of satisfactory development and implementation of the subject procedures.

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. New unresolved items identified during this inspection are discussed in paragraphs 5, 6, 8 and 9.

5. Independent Inspection

- a. Preservice Inspection (PSI) - Assurance that Nonconforming Conditions Identified at Other Tennessee Valley Authority (TVA) Sites are Satisfactorily Addressed at Watts Bar (Units 1 & 2)

PSI and inservice inspection (ISI) programs for TVA nuclear plants are administered by a single corporate group. There is a high degree of commonality in programs, procedures, contractors and examining personnel for PSI and ISI. It is expected then, that nonconforming conditions identified in these areas at one TVA site may also be applicable to other TVA sites. The inspector questioned the licensee regarding how nonconforming conditions identified at other TVA sites would be examined and addressed, if necessary, for the Watts Bar site. The question was specifically directed to corrective action for items recently identified in an NRC inspection (Region II Report 327/80-14 and 328/80-08) at the licensee's Sequoyah Nuclear Plant. The NRC inspector reviewed correspondence documenting to management pertinent information regarding the items identified by the NRC at Sequoyah, but found no formal measures which would ensure that these items would be promptly identified and corrected for Watts Bar. The inspector identified this as an unresolved item, 390/80-10-01 and 391/80-07-01, Assurance that Nonconforming Conditions Identified at Other TVA Sites are Corrected for Watts Bar.

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

6. Preservice Inspection - Review of Ultrasonic Testing (UT) Procedures (Units 1 & 2)

The inspector reviewed the PSI UT procedures indicated below to determine whether the procedures were consistent with regulatory requirements and licensee commitments. The applicable code for PSI, as identified in the licensee's program is ASME Section XI (74S75).

- a. The following procedures were reviewed in the area of procedure approval and requirements for qualification of NDE Personnel:
- (1) TVA - Division of Power Production Procedure No. WB-UT-1 Revision 1 (Ultrasonic Examination of Nuclear Coolant System Piping)
 - (2) TVA - Division of Power Production Procedure No. N-UT-1 Revision 2 (Ultrasonic Examination of Nuclear Coolant System Piping)

NOTE: The licensee replaced procedure WB-UT-1 (see (1) above) with procedure N-UT-1. Both procedures were apparently used for examination of Unit 1 pipe welds.

(3) TVA - Division of Power Production Procedure No. N-UT-6 (0 Degree Straight Beam Ultrasonic Examination of Nuclear Coolant System Piping)

- b. The above procedures were also reviewed for compliance in the area of required records and procedure technical content relative to: type of apparatus, extent of coverage including beam angle and scanning techniques, calibration requirements, search units, DAC curves, reference level for monitoring discontinuities, method of demonstrating penetration, levels for evaluation and recording indications, and acceptance standards.

Paragraph VI (F) of Procedure N-UT-1 describes the calibration blocks used for full node and multiple node inspection of reactor coolant system piping. The calibration block as described in paragraph VI (F) utilizes a 5% notch in lieu of a side drilled hole as required by paragraph T-533 and paragraph T-533-2(a) of article 5 of ASME Section V. The inspector questioned the licensee relative to his justification for use of a notch rather than the Code specified hole. The licensee's Level III examiner submitted that use of the notch in lieu of the hole had been accepted by the ASME Code Inspection Specialist, and therefore would be acceptable per IWA-2240 of ASME Section XI. IWA-2240 permits use of alternative examination methods "provided the results yield demonstrated equivalence or superiority to the satisfaction of the Inspection Specialist". The NRC inspector noted that data provided by the licensee (reference Request for Relief ISI-2 in Sequoyah Nuclear Plant Surveillance Instruction SI-114 Rev. 9) and checks performed on the licensee's calibration blocks at the Watts Bar site indicated that calibration with the notch resulted in a less sensitive examination than would be obtained using the Code specified hole. Therefore, utilization of the notch would be neither superior nor equivalent to calibration with the hole. The inspector's review of the Watts Bar preservice base line inspection program also revealed that reactor coolant piping may initially have been inspected to the licensee's procedure WB-UT-1 Rev 1 which was written to meet the winter 1975 addenda of ASME Section XI. This addenda allowed the use of a 10% notch for calibration, however 10 CFR 50.55(a) did not approve this addenda. The licensee stated that although the procedure may have been used for inspection, a 5% notch was used in lieu of the 10% notch required by the procedure. The inspector requested that the licensee verify this statement.

In view of inconsistencies noted above by the inspector, the licensee agreed to re-evaluate their position and provide the NRC with their justification for proposal of an exception to the Code calibration requirements. In addition, the licensee is to provide the NRC with verification that only 5% notches were used for inspection performed

with procedure WB-UT-1. This matter was identified as unresolved item 390/80-10-01 and 391/80-07-02, "Inconsistency noted in Ultrasonic Testing Procedures for Calibration Block Reflectors".

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

7. Preservice Inspection - Observation of Work and Work Activities (Unit 1)

The inspector observed the PSI activities described below to determine whether these activities were being performed in accordance with regulatory requirements and licensee procedures. See paragraph 6 above for the applicable code.

- a. Personnel qualification records for Level II examiner performing ultrasonic inspection were reviewed.
- b. In-process ultrasonic (UT) inspection, including calibration checks and recalibration on applicable calibration block was observed for the following welds.

<u>Weld Identification Number</u>	<u>Inspection Process Witnessed</u>
CVCS-1	Shear wave inspection
CVCF-D-034-14	Shear wave inspection
CVCF-D-034-14A	Shear wave inspection
CVCFDO-36-10	Compressional wave inspection
CVCFCO-36-10	Compressional wave inspection
CVCFBO-36-10	Compressional wave inspection

The inspections were compared with the applicable procedures in the following areas:

- (1) Availability of and compliance with approved NDE procedures.
- (2) Personnel knowledgeable of examination methods and operation of UT equipment.
- (3) Use of NDE personnel qualified to the proper level.
- (4) Test results properly recorded and evaluated.
- (5) Type of apparatus used.
- (6) Extent of coverage of base material and weldment.
- (7) Calibration requirements.
- (8) Search units size and frequencies.

- (9) Search unit beam angles.
- (10) DAC curves established.
- (11) Reference level for monitoring discontinuities as defined and scanning gain setting as specified.
- (12) Method for demonstrating penetration.
- (13) Limits for evaluating and recording indications.
- (14) Method of recording significant indications.
- (15) Acceptance limits are determined.
- (16) Type of couplant used and certification of specified materials.
- (17) Calibration block notches and block certification verified.

See paragraph 6 for unresolved item on calibration block notches.

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

8. Reactor Coolant Pressure Boundary Piping (Welding) - Review of Quality Records (Unit 1)

The inspector reviewed the quality records for reactor coolant pressure boundary pipe welding to determine whether these records reflected work accomplishment consistent with NRC requirements and FSAR commitments. The applicable code for this welding is the ASME Boiler and Pressure Vessel Code, Section III, Subsection NB, 1971 Edition with Addenda through the summer of 1973 as implemented by TVA General Construction Specification G29M R12. Records of visual and dimensional inspections, weld history, NDE, weld repair, and welder qualification were reviewed for reactor coolant system piping weld 1-068F-W003-01 (31" Dia X 2.60 wall pipe). In addition, radiographic film was reviewed for welds 1-068F-W001-01 and 1-068F-W002-01. An apparently unacceptable linear indication, believed to be a lack of fusion between weld layers, was noted on the film for weld 1-068F-W001-01 (2 repairs). The licensee indicated the weld had been accepted based on additional radiography which showed the linear indication to be in the base metal (for which it would be acceptable) rather than in the weld metal.

The licensee did not have this additional film and stated it had been provided to Westinghouse for the interpretation. The inspector informed the licensee this would be considered an unresolved item, identified 390/80-10-03, Unacceptable RT indication in RC System Piping Weld. Concerns which appear related to this item are described in paragraph 10 below.

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

9. Safety Related Piping (Welding) - Review of Quality Records (Units 1 & 2)

The inspector reviewed the quality records described below relative to safety related pipe welding to determine whether these records reflected work accomplishment consistent with NRC requirements and SAR commitments. The applicable code for this welding is the ASME Boiler and Pressure Vessel Code, Section III, subsection NC 1971 Edition with Addenda through the summer of 1973 as implemented by TVA General Construction Specification G29M R12.

- a. The following completed weld records were reviewed in the areas of visual and dimensional inspections, weld history, NDE, weld repair and welder qualification:

<u>Weld Number</u>	<u>System</u>
1-063A-D074-12B	Safety Injection
1-003B-D002-15	Feedwater

- b. Radiographic film was reviewed for the safety related piping welds listed below, which represent all of the 2-62 (Unit 2 - Chemical Volume Control System) and 1-63 (Unit 1 - Safety Injection System) weld film shot during February and March 1980 (as determined from the licensee's film logs).

<u>Weld Film Review</u>	<u>Comments</u>
2-062A-D014-05D	Blotchy but acceptable
2-062B-D134-17C	
1-063A-D074-08J	
2-062A-D014-05A	
2-062A-D015-12	
2-062A-T122-29	
2-062A-T122-41	
2-062A-D013-05B	
2-062A-D013-05A	
2-062A-D010-18	
2-062A-D004-16A	
2-062A-D004-16	
2-062A-D010-16	
2-062A-D006-19A	
1-063B-D086-03	
1-063B-D086-03C	
1-063A-D074-01B	
1-063A-D074-01E	
1-063A-D074-02	-15% + 30% density criteria exceeded on film 1 - 2

<u>Weld Number</u>	<u>Comments</u>
(Continued)	
1-063A-D074-03A	
1-063A-D074-04	
1-063A-D074-08A	
1-063A-D074-08B	
1-063A-D074-08D	
1-063A-D074-08GC1	
1-063A-D074-08N	
1-063A-D074-08R	

Film for weld 1-03B-D002-15 (Unit 1 feedwater system weld) was requested for review by the inspector but could not be located. This film is for a weld associated with a concern described in paragraph 10 below. In a telephone call on April 18, 1980, the licensee informed the inspector the film had been located and was available for review. Review of this film and other documentation relative to this weld (as described in paragraph 10 below) represent an unresolved item, identified 390/80-10-04, Concerns Regarding FW System Weld.

As indicated above in the "film review comments" the identification on film for weld 2-062A-D010-18 (Unit 2) was illegible and the density on film for weld 1-063A-D074-02 (Unit 1) was outside specified limits. These appear to be isolated occurrences and do not indicate rejectable welds. The licensee was requested to provide acceptable film for these welds. This is identified as an unresolved item, 390/80-10-05 and 391/80-07-03, Unacceptable Identification and Density on RT Film.

Within the areas examined, there were no items of noncompliance or deviation identified.

10. Worker Concerns (Units 1 & 2)

Prior to and during the inspection, the NRC inspector was advised of several concerns expressed by a worker. The concerns expressed and the findings of this inspection relative to these concerns are as follows:

a. Concern

Some radiographic film shot on safety related welds was splotchy (i.e., lacked proper clarity). Examples of such film may be found scattered among Unit 2 Chemical Volume Control (CVC) system (system number 62) weld shots during March 1980.

Findings

As described in paragraph 9 the inspector reviewed all radiographs shot on Unit 2 CVC system piping during March 1980. Some splotchy film was found, but its quality was adequate to meet the applicable code requirements. No further investigation of this concern is planned.

b. Concern

Radiographs of a Unit 1 steam generator safe end weld showed a linear indication that appeared unacceptable. Parallax shots were made which showed the indication to be in the base metal adjacent to the weld. This indication was believed to have been located on the elbow side of the weld. The nuclear steam system supplier, Westinghouse, reviewed the film and accepted the condition.

Findings

The inspector reviewed the film for Unit 1 steam generator safe end welds as described in paragraph 8 above. The indication was found as described by the allegor but it appeared to be in the weld rather than the base metal. As noted in paragraph 8 the acceptability of the indication remains unresolved. The item will be addressed further in subsequent NRC inspection.

c. Concern

UT detected a questionable indication in a feedwater (FW) system (system 03) pipe weld. Initial radiography performed on the weld to satisfy code (ASME Section III) requirements had not revealed any unacceptable indications. Subsequent radiography performed to supplement the UT was inadequate for this purpose because of scatter produced by water in the pipe. Therefore, the indication detected by UT may not have been satisfactorily evaluated.

Findings

From a description provided by the worker, the inspector identified the subject weld to be 1-003B-D002-15. As noted in paragraph 9 film for this weld was requested by the inspector but could not be located by the licensee during the inspection. The missing film and the UT records will be reviewed with regard to this concern in subsequent inspection under the unresolved item identified in paragraph 9 (Item 390/80-10-04).

d. Concern

A weld in the Unit 1 safety injection (SI) system (system 63) piping from the boron injection tank in the 713 elevation pipe chase was radiographed and accepted during March 1980. This weld should not have been accepted.

Findings

As noted in paragraph 9 all safety injection system pipe welds shot during February and March 1980 were reviewed by the inspector. The

film for one of the safety injection system welds did not appear to meet code density requirements but the film quality was adequate to indicate that the weld was satisfactory.

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