



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

Report Nos. 50-259/81-36, 50-260/81-36, 50-296/81-36

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

Facility Name: Browns Ferry

Docket Nos. 50-259, 50-260, 50-296

License Nos. DPR-33, DPR-52, DPR-68

Inspection at Browns Ferry site near Decatur, Alabama

Inspectors: <u>E. H. Girard</u>	<u>12/31/81</u>
E. H. Girard	Date Signed
<u>J. L. Coley</u>	<u>12/31/81</u>
J. L. Coley	Date Signed
Approved by: <u>A. R. Herdt</u>	<u>12/31/81</u>
A. R. Herdt, Section Chief	Date Signed
Engineering Inspection Branch	
Engineering and Technical Inspection Division	

SUMMARY

Inspection on November 30 - December 4, 1981

Areas Inspected

This routine, unannounced inspection involved 75 inspector-hours on site in the areas of licensee action on previous inspection findings (Units 1, 2 and 3), inspector followup items (Units 1, 2 and 3), IE Bulletins (Units 1, 2 and 3), Information Notices (Units 1, 2 and 3), inservice inspection (ISI) program (Unit 1, 2, and 3), ISI procedures (Units 1, 2 and 3), ISI work (Unit 3), nondestructive examination (Units 1, 2 and 3), and torus welding (Unit 3).

Results

Of the nine areas inspected, no violations were identified in seven areas and three violations were found in two areas (Violation - Inadequate procedure for installation and inspection of locking devices - paragraph 7; Violation - Failure to insure that special processes are controlled - paragraph 3.h; Violation - Missing ISI reports - paragraph 3.c). No deviations were identified.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *G. T. Jones, Power Plant Superintendent
- *J. E. Swindell, Field Services Supervisor
- T. L. Chinn, Plant Compliance Supervisor
- *D. T. Nye, Assistant Field Services Supervisor
- *C. J. Rozear, Compliance Engineer
- J. Traglia, Mechanical Maintenance Specialist
- *R. Cole, QA Site Representative (Browns Ferry site), Office of Power
- W. Glasser, QA Site Representative (Sequoyah site), Office of Power
- T. Schreeder, PSI/ISI Engineer - Level III Examiner
- *R. Latimer, ISI Coordinator
- J. Fox, Metallurgical Engineer, Codes and Standards Group

NRC Resident Inspector

- *R. F. Sullivan
- *J. Chase
- *G. Paulk

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on December 4, 1981 with those persons indicated in paragraph 1 above. The inspectors described the areas inspected and discussed in detail the following new items which were identified as a result of the inspection:

(Open) Unresolved Item 259, 260, 296/81-36-01: "CRT Screen Extremity Used for Examination Calibration Point" - Paragraph 9.

(Open) Inspector Followup Item 259, 260, 296/81-36-02: "Incorrect Figure Used in UT Procedure to Demonstrate Base Metal Coverage for B-B and B-D Category Examinations" - Paragraph 9.

(Open) Violation 259, 260, 296/81-36-03: "Inadequate Procedure for Installation and Inspection of Locking Devices" - Paragraph 7.

(Open) Violation 259/81-36-04: "Failure to Insure That Special Processes are Controlled" - Paragraph 3.h.

(Open) Unresolved Item 259, 260, 296/81-36-05: "Methods for Locating Welds Ground Flush Are Not Clearly Defined" - Paragraph 10.a.

(Open) Violation 259, 296/81-36-06: "Missing ISI Reports" - Paragraph 3.c.

3. Licensee Action on Previous Inspection Findings

- a. (Open) Violation 260/80-34-03: Undersized Socket Welds. This item involved socket welds which had been completed and accepted by TVA but which the NRC inspector found did not meet the minimum size requirements specified by the applicable code. The welds identified as undersize were nine pipe to socket fillet welds on a High Pressure Coolant Injection (HPCI) System by pass line for Unit 2. TVA's letters of response for this item, dated February 18 and March 30, 1981, have been reviewed and determined acceptable by Region II. In the response letters TVA indicated that weld metal was added to the welds and that they had been re-examined and accepted.

The inspectors re-examined and verified adequate sizes for the subject Unit 2 HPCI bypass line welds.

This item will remain open pending further examination of additional examples of socket welds by Region II for verification of the licensee's corrective actions.

- b. (Closed) Unresolved Item 259, 260/81-07-05: Technical Specification Changes. The inspectors verified licensee's submittal to the NRC of technical specification changes to comply with requirements of 10 CFR 50.55a(g)(5)(ii). The changes were submitted in a letter from Mr. L. M. Mills (Manager of Nuclear Regulation and Safety - TVA) to Mr. H. R. Denton, (Director, Office of Nuclear Reactor Regulation - NRC) dated November 7, 1981.

This matter is considered closed.

- c. (Open) Unresolved Item 259, 260; 296/81-13-10: ISI Reports. The inspectors identified the following outages for which the licensee could not find copies of the ISI reports required by IS-622.2 of ASME Section XI (71S71) for Units 1 and 2, and by IWA-6220 of ASME Section XI (74S75) for Unit 3:

(1) Unit 1 outage dated -

- (a) 9/13/77 - 1/15/78
- (b) 1/3/80 - 3/22/80

(2) Unit 2 outage dated -

- (a) 4/27/79 - 6/1/79

(3) Unit 3 outages dated -

- (a) 9/8/78 - 11/25/79
- (b) 11/23/80 - 1/18/81

The licensee informed the inspectors that no ISI had been performed during the Unit 2 outage of 4/27/79 - 6/1/79, but that there was ISI during the other outages referenced. The licensee also stated that it appeared that the ISI reports for the Units 1 and 3 outages referred to above had never been prepared. ASME Section XI requires preparation and maintenance of the reports as site ISI records and requires that they be filed with the NRC within 90 days of completion of the inspections. The licensee's apparent failure to comply with these requirements is considered a violation 10CFR 50.55a(g) which specifies use of ASME Section XI. This violation is identified 259, 296/81-36-06, "Missing ISI Records."

- d. (Closed) Unresolved Item 296/81-20-02: Weld Size and Quality on Pipe Hangers. This item involved a pipe hanger weld on Unit 3 hanger H-25 which was questioned by the inspector because it appeared undersize and had overlap and apparently excessive convexity. The inspectors discussed the weld with the cognizant licensee maintenance engineer responsible for reinspection of such hangers (as required by IE Bulletin 79-14); reviewed the pipe support checklists which reported the conditions for hanger H-25 and of adjacent hangers (26, 27 and 28) for disposition by the design engineer, verified the design engineer's approval of the hangers for temporary continued use, and examined welds on hanger H-25 and the other nearby hangers (H-26, 27 and 28) in all three units to determine their quality. The inspectors were informed that, while the hangers checked were considered adequate for current temporary use, they would be replaced in a future outage.

Based on the discussion, inspection and verifications noted above the inspector is satisfied that this item may be closed.

- e. (Closed) Unresolved Item 259/81-13-11: Radiographic Film Identification Not Legible. Film identification for weld joints TP-1-D, TP-1-E and TP-1-F were reported faint to nonlegible. The licensee investigated this problem and properly identified all film that fell in this category. The inspectors reviewed a selected sample of film and determined that the licensee had taken adequate corrective action. This item is considered closed.
- f. (Closed) Unresolved Item 259/81-13-16: High-stress Die Stamping Used on Main Steam Pipe Assemblies. Films of weld joint TP-1-F disclosed die stamp markings on the base metal that appeared to be sharp bottomed. At the time this item was identified the licensee checked their tool issue station and reported high stress die stamps were available for issue. Subsequently the licensee determined that although the die stamps appeared to be high stress they were low stress and unique identification was on each stamp to confirm its type. The inspectors verified this and that the subject low stress stamps could make an indentation similar to that observed on the above film. This item is considered closed.

- g. (Closed) Unresolved Item 259/81-13-15: Possible Unacceptable Base Metal Defect. Films of weld joint TP-1-F (3-0) showed a 3/4 inch long depression in the base metal about 1½-inch from the weld. This indication was not evaluated on the film reader's sheet. The indication appeared to be deep and could have violated minimum pipe wall requirements. The inspectors found that the licensee removed the indication by grinding and performed a UT examination for minimum wall thickness in the ground area with satisfactory results. In addition, the film segment in question was re-radiographed. This item is considered closed.
- h. (Closed As Unresolved Item, Upgrade to Violation) Unresolved Item 259/81-13-14: Possible Unacceptable Defect in Weld. In a previous NRC inspection, film of accepted weld TP-1-H, location (2-3), revealed a 1½-inch long linear indication in the weld that was not evaluated on the film reader's sheet. The licensee's radiography procedure, N-RT-1 requires evaluation of such indications. The licensee indicated at the time that this area would be re-radiographed using a single wall exposure technique to better evaluate the indication. When questioned about this item by the inspectors in the current inspection the licensee stated that they had ground the internal root surface in the questioned area, re-radiographed the ground area, and that the area was determined acceptable. However, the NRC inspectors noted that film presented by the licensee as an acceptable radiograph of location 2-3 was in fact a radiograph of another location. The location markers apparent on the film incorrectly indicated that the film segment was 2-3. The inspectors determined that the film was location 1-2 by noting that the welder's I.D. was die stamped on the initial radiograph under the film location marker 1. On the reshot the welders ID was die stamped under the film location marker 2. In addition, a tungsten inclusion noted on the initial radiograph of segment 2-3 was not present on the reshot of segment 2-3. The licensee's procedure for radiography (N-RT-1) requires that the image of location markers appear on the film and that their location be marked on the surface near the weld in such a manner that defects appearing on radiographs may be accurately located. The licensee stated that the location identification was probably removed by subsequent grinding in the area. The inspectors, however, pointed out that two qualified film interpreters had reviewed the film and that neither had detected that the film they were reviewing and accepting was a totally different weld area than the area initially questioned by NRC. 10 CFR 50, Appendix B, Criterion IX, requires that special processes, such as radiography of welds, be controlled and accomplished by qualified personnel using qualified procedures that are in accordance with applicable codes. The licensee's failure to evaluate the linear indication appearing on the original acceptance radiographs for weld TP-1-H, and their failure to properly locate the indication for subsequent evaluation are considered examples of failure to control and accomplish radiography in accordance with the licensee's procedure and the code requirements referenced therein. This is considered a violation of the requirements of Criterion IX and is identified item 254/81-36-04, "Failure to Insure

That Special Processes Are Controlled". The inspectors questioned both the proficiency of the licensee's radiographic examination personnel and the adequacy of the licensee's procedures as possible causes of the apparent violation.

Within the area inspected, no deviations or violations were identified except for the violations described in 3.c and 3.h.

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 paragraphs 9 and 10a.

5. Inspector Followup Items

- a. (Closed) Inspector Followup Item 259, 260, 296/81-07-02: Revised ISI Program. The inspectors found that the licensee had issued their revised ISI program. In accordance with a previous commitment a copy was provided to Region II. This item is considered closed.
- b. (Closed) Inspector Followup Item 260/81-20-01: Nut On Hanger Bolt Not Fully Engaged. This item concerns a inadequate nut and bolt connection which the inspector found on a Unit 2 HPCI bypass line hanger in previous inspection. The licensee informed the inspector that the bolt at the connection had been found to be under length and that it had been replaced. The inspector examined this connection and similar bolted connections on the Unit 1 and 3 HPCI bypass lines to verify their adequacy. In addition, the inspector inspected the other bolted connections on nearby safety related lines (all three units), including those on RHR line hangers H-25, 26, 27 and 28. This item is considered closed.
- c. (Open) Inspector Followup Item 259, 260, 296/81-13-04, Magnetic Particle Procedure Does Not Provide Complete Instructions. Magnetic Particle procedure N-MT-1 Rev. 2 did not clearly specify the amount of lighting required for adequate examination of a test surface. The licensee had revised the MT procedure to include the visual requirement that lighting in the examination area be sufficient to distinguish a 1/32 inch black line on a 18% neutral gray background. The inspector discussed this requirement with the licensee and the licensee agreed that under certain condition this would not ensure that lighting would be adequate to evaluate fine line MT indications. The licensee agreed to revise the MT procedure to state that lighting shall be equivalent to 32 foot candles and that the light from a flashlight with good batteries at a distance of three feet or less would be considered adequate to meet this requirement. This change will be verified on a subsequent inspection.

- d. (Open) Inspector Followup Item 259, 260, 296/81-13-03: Liquid Penetrant Procedures Do Not Provide Complete Instructions. Liquid penetrant procedures N-PT-1, N-PT-2, N-PT-3 and BF-PT-1 failed to specify the amount of base metal adjacent to welds that is required to be examined. The licensee had revised N-PT-1, which is used most frequently for inservice inspection. Other procedures noted above are in various stages of revision, deletion or approval. This item will remain open until completion of all licensee corrective actions.

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

6. IE Bulletins (IEB's) (Units 1, 2 and 3)

(Closed) IEB 80-BU-07 with Supplement No. 1: EWR Jet Pump Assembly Failure. As noted in IE Report 259, 260, 296/81-13, the NRC inspector reviewed procedures, records and viewed portions of the examinations required by the bulletin. The licensee reported the results of the examinations to Region II. The NRC resident inspectors informed the inspectors that they had verified the operational procedures and surveillances required by B.2 and B.4 of the bulletin. The inspectors are satisfied that the requirements of the bulletin have been met and that it may be closed. However, the inspectors encouraged the licensee to continue the visual and UT examinations of the bulletin to assure the continued integrity of the jet pumps and noted that additional NRC requirements for continuation of the examinations are being considered.

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

7. Information Notices (Units 1, 2, and 3)

IE Information Notice No. 81-33: Locking Devices Inadequately Installed on Main Steam Isolation Valves. The inspectors found that the inspections of locking devices described by this Notice had not been performed by the licensee. However, the licensee had developed work plans to conduct these inspections. The inspectors, accompanied by a representative of the licensee, observed several Main Steam Isolation Valves (MSIV's) in both the Dry Well area and the Steam Tunnel for Unit 3 that had locking devices installed incorrectly. Discrepancies noted with the locking devices for Unit 3 MSIV's were not vendor related as reported in I.E. Information Notice 81-33, because damage from reuse and coldworking was apparent. Locking devices were also noted that did not engage the flats of fasteners and/or the spring plate/stem plate. Examples of locking devices that did not serve a useful purpose were noted on MSIV - FW-3-1-4 (A inbound valve) which had one nut that had backed off the stud several thread turns and another nut which was loose. Licensee procedures were reviewed and it was determined that procedure MMI-17 (which dealt with the maintenance of the MSIV's) instructed the craft to bend the locking device. However, the licensee did not have any generic procedures on how to correctly install locking devices or acceptance criteria available for an inspector to determine if the locking device installed was acceptable. The licensee stated

that MMI-17 would be revised, to include installation and inspection instructions for bending locking devices on the MSIV's. In addition, the licensee stated that they would look into developing a generic procedure for installation and inspection of all locking devices. Failure to have adequate installation procedures to insure that generic activities affecting quality are performed correctly is a violation of 10CFR50 Appendix B, Criterion V and was reported as item No. 259, 260, 296/81-36-03, "Inadequate Procedures for Installation and Inspection of Locking Devices."

Within the areas inspected one violation was identified as described above. No deviations were noted.

8. Inservice Inspection - Review of Program (Units 1, 2 and 3)

The inspectors reviewed, in part, the licensee's ISI program document and licensee QA program documents with requirements applicable to the ISI program, as described below. The review was conducted to verify the licensee's conformance with regulatory requirements and the licensee's commitments. The areas and documents addressed in the review were as follows:

a. ISI Program Document Approval

The inspectors reviewed the licensee's program document, Surveillance Instruction 4.6.2 (approved 9/29/81), to verify proper approval by the licensee.

b. QA Program Audits

The inspectors reviewed the licensee's audit requirements, as contained in Section OP-QAP-18.1R3 of the Office of Power QA Manual and Section QAAS-QAP-3.1R8 of the QA Staff Procedure Manual, to verify establishment of requirements to assure proper control and accomplishment of audit activities relative to:

- (1) Audit procedures and checklists
- (2) Audit criteria, management review and assessment, corrective action and followup, and documentation of audit results
- (3) Qualifications and responsibilities of auditors

In the course of the review the NRC inspectors found that an audit of ISI was in progress. The inspectors reviewed the checklist and the preliminary audit findings to verify their compliance with the QA document requirements. The audit was identified as Audit No. OPQAA-BF-8100-SP-05.

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

9. Inservice Inspection - Review of Procedures (Units 1, 2 and 3)

The inspectors reviewed the licensee's ISI procedures to verify conformance with regulatory requirements and the licensee's commitments. The licensee identified their current code commitment for ISI as ASME Section XI (74S75). The following procedures were reviewed:

<u>PROCEDURE NO.</u>	<u>TITLE</u>
N-UT-2 Rev. 4	UT of Pressure Vessel Nozzle Forging Inner Radii
N-UT-4 Rev. 1	Ultrasonic Examination of Nuclear Uncladded Pressure Vessels and Nozzles In the Thickness Range of .20 "to 2.5."
N-UT-5 Rev. 1	Ultrasonic Examination of Studs, Bolts, Shafts and Bars
N-UT-7 Rev. 2	Ultrasonic Examination of Vessel Support Skirt Weld
N-UT-8 Rev. 1	Procedure for UT of Flange Ligaments Areas
N-UT-9 Rev. 1	U.T. Examination of Ferritic Butt Welds and Adjacent Base Metal in the 2½ Inch and Greater Thickness Range
N-UT-15 Rev. 0	U.T. Examination of Nozzle Bore Region From Nozzle Outside Diameter
BF-UT-17 Rev. 0	Ultrasonic Examination of Nuclear Power Plant Piping
N-PT-1 Rev. 4	Liquid Penetrant Examination using the Color Contrast Solvent Removable Method
N-MT-1 Rev. 2	Magnetic Particle Examination of Nuclear Power Plant Components
N-UT-1 Rev. 1	Visual Examination of Nuclear Power Plant Components
N-UT-4 Rev. 1	Visual Examination of Hanger Supports and Restraints

The inspectors review of procedure N-UT-4 revealed the following concerns:

- a. For material thickness greater than 2 inches to 2½ inches the procedure requires use of a full node metal path with the sweep range on the

calibrated UT instrument set so that the ID point is on the fifth screen division and the OD point on the tenth screen division. This calibration is unsatisfactory because OD indications on materials thicker than the calibration block would not appear on the CRT screen presentation. The licensee stated that this procedure would be revised to correct this technique problem. This item was reported as unresolved item 259, 260, 296/81-36-01, "CRT Screen Extremity Used for Examination Calibration Point."

- b. Figure 4 in N-UT-4 is for B-A Category examinations which are not covered by procedure N-UT-4. The correct figures for this application are figures IWB-3511 and IWB-3512 of the ASME Section XI (74S75).

The licensee stated that this procedure would be revised to include inspection coverages as delineated by the above figures. This item was reported as inspector followup item No. 259, 260, 296/81-36-02, "Incorrect Figure Used in UT Procedure to Demonstrate Base Metal Coverage for B-D & B-B Category Examinations."

Within the areas examined no violations or deviations were observed.

10. Inservice Inspection - Observation of Work and Work Activities (Unit 3)

The inspectors observed ISI work and work activities for conformance with the regulations and licensee commitments, including applicable code requirements. The code applicable to ISI is ASME Section XI (74S75). The activities observed and the inspectors findings were as follows:

a. Ultrasonic Examination (UT) of Reactor Vessel Weld

The inspectors observed the shear wave UT examination of reactor vessel vertical weld V-3-A. The licensee's procedure for examination of this weld was N-UT-9. Weld V-3-A had been ground flush and was not readily observable. The licensee's examiners identified its location roughly from its angular position, reportedly obtained from a drawing. Its more precise location was determined based on the ascertainment that it was centered between two lightly stamped X's on the vessel. The inspectors were concerned that the weld might not have been adequately located and that there were no clearly defined instructions as to how location should be assured in such instances. The inspector's concerns were identified as unresolved item 296/81-36-05, "Methods of Locating Welds Ground Flush Are Not Clearly Defined."

b. Review of Examiner Qualifications

Certifications for the following examiners were verified:

<u>EXAMINERS</u>	<u>QUALIFICATIONS & LEVEL</u>	<u>EYE TEST</u>
R. S. Arnwine	L-II MT; L-II PT; L-II UT	81-04-24
J. L. Simpson	L-II MT; L-II PT; L-I UT	80-10-14
T. B. Schreeder	L-III MT; L-III PT; L-III UT	81-02-12
R. Willie	L-II MT; L-II PT, L-II UT	81-10-1
R. A. Latimer	L-II MT; L-II PT, L-II UT	81-05-19

Qualification and Certification records for the above individuals were observed to ascertain the following:

- (1) Activity qualified to perform
- (2) Level of certification
- (3) Effective period of certification
- (4) Signature of individual certifying title and level
- (5) Basis used for certification, such as the required number of training hours, etc. for the respective NDE method
- (6) Annual visual acuity and color vision examination and periodic recertification.

Within the areas inspected no violations or deviations were observed.

11. Nondestructive Examination (Units 1, 2, & 3)

The inspectors reviewed the following nondestructive examination procedures utilized by maintenance and modification personnel assigned to Brown's Ferry. This review was performed to ascertain whether the licensee's nondestructive examination practices and procedures are in conformance with regulatory requirements and licensee commitments. The applicable code for this review is delineated in paragraph 9. Procedures reviewed consisted of the following:

<u>PROCEDURE</u>	<u>REV</u>	<u>TEST</u>
N-PT-1	4	Liquid Penetrant
N-MT-1	2	Magnetic Particle
BF-UT-17	0	Ultrasonic
N-RT-1	0	Radiography

Within the areas inspected no violations or deviations were observed.

12. Welding (Unit 3)

The inspectors observed the general quality of in-process welding on structural welds for the torus modification to verify their conformance with the applicable code (AWS D1.1) and TVA Specification (G29C). The NRC inspectors were informed that the welds observed in the area had not been completed and had not received final QC inspections.

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