



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA ST., N.W., SUITE 3100
ATLANTA, GEORGIA 30333

Report Nos. 50-259/82-22, 50-260/82-22, and 50-296/82-22

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

Facility Name: Browns Ferry

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

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

Inspection at Browns Ferry site near Decatur, Alabama and Licensee Offices in Chattanooga, Tennessee

Inspector: James L. Coley, Jr.
J. L. Coley, Jr.

Date Signed

Approved by: N. E. Eohomo
N. Eohomo, Acting Section Chief
Engineering Inspection Branch
Division of Engineering and Technical Programs

8/12/82
Date Signed

SUMMARY

Inspection on July 12-16, 1982

Areas Inspected

This routine, unannounced inspection involved 33 inspector-hours on site in the areas of data review and evaluation for Unit 3 inservice inspection outage, review of inservice inspection procedures (Units 1, 2 and 3), licensee action on previous inspection findings (Units 1, 2 and 3), inspector followup items (Units 1, 2 and 3) and IE Bulletin 80-08 (Units 1, 2 and 3).

Results

No violations or deviations were identified.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *G. T. Jones, Plant Superintendent, Browns Ferry Nuclear Plant (BFNP)
- *T. L. Chinn, Compliance Staff Supervisor, BFNP
- J. Miller, Field Services Supervisor, BFNP
- C. J. Rozear, Compliance Engineer, BFNP
- L. Parvin, Quality Control Supervisor, BFNP
- A. Gandy, QA Engineer, BFNP
- **D. A. Howard, Supervisor, Baseline and Inservice Inspection Group (BISIG)
- **G. Minton, Supervisor, Inspection Section, BISIG
- **M. Gothard, Mechanical Engineer, BISIG
- **T. B. Schreeder, Power Plant Maintenance Specialist, BISIG
- **R. Bentley, Power Plant Maintenance Specialist, BISIG
- **J. Lewis, Mechanical Engineer, BISIG
- **R. Latimer, ISI Coordinator, BISIG

NRC Resident Inspector

- *G. Paulk

*Attended exit interview held at Browns Ferry site on July 14, 1982.

*Attended exit interview held at TVA Offices in Chattanooga, Tennessee on July 16, 1982.

2. Exit Interview

The inspection scope and findings were summarized on July 14 and 16, 1982, with those persons indicated in paragraph 1 above. The inspector described the areas inspected and discussed in detail the inspection finding listed below. No dissenting comments were received from the licensee.

(Open) Unresolved Item 259,260,296/82-22-01: Inadequate Radiographic Procedure - paragraph 8.

3. Licensee Action on Previous Enforcement Matters

- a. (Closed) Violation 259,260,296/81-13-01: Inadequate examination instructions. The Tennessee Valley Authority (TVA) letter of response dated August 17, 1981, has been reviewed and determined acceptable by Region II. The NRC inspector held discussions with the licensee's compliance engineer and examined the corrective action as stated in the letter of response. The inspector concluded that TVA had determined the full extent of the subject violation and performed the actions necessary to correct the conditions present and to preclude recurrence. The corrective action identified in the letter of response has been implemented.

- b. (Closed) Deviation 259, 260, 296/81-13-20: The quality of radiographic films for containment penetration welds are in nonconformance with ASME Code requirements. TVA letters of response dated August 17, 1981, and January 29, 1982, have been reviewed and determined acceptable by Region II. The NRC inspector held discussions with the licensee's compliance engineer and examined the corrective action as stated in the letters of response. The inspector concluded that TVA had determined the full extent of the subject deviation and performed the actions necessary to correct the condition present and to preclude recurrence. The corrective action identified in the letters of response has been implemented.
- c. (Closed) Violation 259, 296/81-35-06: Missing ISI reports. TVA letters of response dated February 18, 1982 and March 16, 1982, have been reviewed and determined acceptable by Region II. The NRC inspector held discussions with the licensee's compliance engineer and examined the corrective action as stated in the letters of response. The inspector concluded that TVA had determined the full extent of the subject violation and performed the action necessary to correct the condition present and to preclude recurrence. The corrective action identified in the letters of response has been implemented.
- d. (Closed) Violation 259, 296/82-04-01: Failure to follow welding and NDE procedures. TVA letter of response dated April 6, 1982, has been reviewed and determined acceptable by Region II. The NRC inspector held discussions with the licensee's compliance engineer and the supervisor of field services and examined the corrective action as stated in the letter of response. The inspector concluded that TVA had determined the full extent of the subject violation and performed the actions necessary to correct the condition present and to preclude recurrence. The corrective action identified in the letter of response has been implemented.
- e. (Closed) Violation 259/81-16-03: Failure to control PT. TVA letter of response dated September 4, 1981, has been reviewed and determined acceptable by Region II. The NRC inspector held discussions with the licensee's compliance engineer and examined the corrective action as stated in the letter of response. The NRC inspector concluded that TVA had determined the full extent of the subject violation and performed the actions necessary to correct the condition present and to preclude recurrence. The corrective action identified in the letter of response has been implemented.
- f. (Closed) Violation 259/81-16-04: Failure to follow welding and inspection procedures. TVA letter of response dated September 4, 1981, has been reviewed and determined acceptable by Region II. The NRC inspector held discussions with the licensee's compliance engineer and examined the corrective action as stated in the letter of response.

The inspector concluded that TVA had determined the full extent of the subject violation and performed the actions necessary to correct the condition present and to preclude recurrence. The corrective action identified in the letter of response has been implemented.

- g. (Closed) Unresolved Item 259, 260, 296/81-11-01: Lack of procedure for maintenance of welder qualifications. This item involved the inspector's finding that the licensee did not have a procedure which described the method being used to track maintenance of welder qualification and that cognizant licensee personnel did not appear to fully understand how maintenance of qualification was to be assured. The NRC inspector held discussions with the licensee's field services engineer and examined TVA's Modification/Addition Instruction #3 (MAI-3) dated September 29, 1981, which adequately cover renewal of welder qualifications. The inspector also reviewed several current copies of MAI 3 attachment 2 which are used to update welder qualifications by accounting for all weld rod issue cards used by each specific welder.
- h. (Closed) Unresolved Item 259/81-16-02: Qualification of visual examiners for ISI. This item involved the inspector's finding that the examiners for visual inspection were only qualified for liquid penetrant (PT) or magnetic particle (MT) inspection methods. Paragraph IWA-2300 (b) of the 1974 edition of Section XI requires that, "For nondestructive examination methods not covered by SNT-TC-1A documents, personnel shall be qualified by the owner or his agent to comparable levels of competency by subjection to comparable examinations on the particular method involved". As a result of this item, the visual inspection procedure being used by the licensee, procedure N-VT-1, has been revised to include qualification in accordance with the requirements of SNT-TC-1A. TVA Power Divisions have presently certified approximately 20 examiners to the visual requirements of the procedure and training is continuing on an as needed priority basis.
- i. (Closed) 259/81-13-13: Threaded holes in reactor vessel flange not examined. This item involved an apparent failure of the licensee to perform visual inspection of the flange pressure retaining bolting. However, the licensee found records indicating that this inspection was in fact performed on August 20, 1976, by G. T. Jones, presently the Plant Superintendent at the Browns Ferry site, and examined again on January 9, 1979, as annotated in Browns Ferry ISI Report No. R069. The requirements to examine the reactor vessel flange pressure retaining bolting is properly addressed in TVA's ISI program.

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

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 8.

5. Inspector Followup Items (92701B)

- a. (Closed) 259,260,296/81-13-19: Supplemental information to be provided to NRC. This item involved TVA's commitment to provide a supplemental response for IE Bulletin 80-08. TVA letter of supplemental response to the final report dated August 7, 1981, has been reviewed by Region II and determined to be acceptable. This matter is considered closed.
- b. (Closed) 259,260,296/81-13-03: Liquid penetrant (PT) procedures do not provide complete instructions. This item dealt with the failure of TVA's PT procedures to specify the amount of base metal adjacent to welds that are required to be examined in order that Section XI requirements of the ASME Code are incorporated. TVA has presently revised PT Procedures N-PT-1 thru N-PT-6 to include surface conditioning restrictions and the extent of base metal inspection.
- c. (Closed) 259/81-13-17: Inservice inspection program does not appear to meet minimum requirements of Section XI of ASME Code. This item involved the inspector's finding that TVA's ISI program document requires visual and ultrasonic examination for vessel closure studs and nuts in one table, but requires magnetic particle and ultrasonic examination for these items in another table. During past inservice inspection, visual and ultrasonic examinations were performed. This was in compliance with the original code commitment to the Summer 1971 addenda of the 1971 Code. TVA has revised the Browns Ferry ISI program and tables to require magnetic particle (MT) and ultrasonic examinations for the vessel closure studs and nuts. This complies with the recently updated commitment to the Summer 1975 addenda of the 1974 edition of the Code.
- d. (Closed) 259, 260, 296/81-13-04: Magnetic particle procedure does not provide complete instructions. This item dealt with the failure of procedure N-MT-1, Rev. 2 to specify the amount of lighting required for adequate examination of test surface. TVA has revised N-MT-1 to include lighting requirements for magnetic particle examinations and evaluations of indications.

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

6. IE Bulletins - Units 1, 2 and 3 (92703B)

(Closed) IEB 80-BU-08: Examination of containment liner penetration welds. IE Bulletin No. 80-08 was forwarded to TVA on April 7, 1980. It requested licensees to determine if their facilities contained the flued head design for penetration connections, or other designs with containment boundary butt welds between the penetration sleeve and process piping as illustrated in Figure NE 1120-1, Winter 1975 addenda to the 1974 and later editions of the ASME Boiler and Pressure Vessel Code. If the licensee's facility contained this design then the licensee was requested to determine if welds were made

with a backing ring and whether or not volumetric examination was conducted by radiography. The bulletin indicates that weld joints with a backing ring that have not been radiographed, are of particular concern as they are potentially defective. TVA's letter of response dated July 7, 1980, to this bulletin was in error in that it stated that no backing rings were used for butt welds between containment penetration sleeves and process piping at Brown Ferry; whereas during inspection 259,260,296/81-13, Region II found that backing rings had been used. TVA agreed to provide a corrected bulletin response to Region II. In addition, they agreed to investigate and determine the cause of the discrepancies in their original report for the bulletin.

The bulletin response corrections and their findings as to the cause of the discrepancies in the original response were provided to Region II by TVA in letters dated August 7, 1981, and January 29, 1982. These letters were reviewed by Region II and determined acceptable.

Within the areas examined no violations or deviations were identified.

7. Independent Inspection Effort (92706B)

The inspector conducted a general inspection of the fabrication shop, weld rod issue stations, and the welding school to observe construction progress and construction activities such as welding, material handling and control, housekeeping and storage for the Unit 2 outage which is planned for August. In addition, the NRC inspector attended an eight hour training session for engineers on the repair and replacement of a system to the ASME Code Section IX requirements. This training was conducted in response to TVA commitment for NRC violation 259, 296/81-36-06.

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

8. Inservice Inspection - Review of Procedure (73052)

The inspector reviewed the ISI procedures indicated below to determine whether the procedures were consistent with regulatory requirements. The applicable code for the "cycle 4" inspections is the ASME Boiler and Pressure Vessel Code, Section XI with the 1974 Edition, S75 Addenda being used for extent of inspection and 1977 Edition, S78 Addenda being used for technique evaluation.

| <u>Procedures Reviewed</u> | <u>Title of Procedure</u> |
|----------------------------|--|
| N-VT-1, Revision 3 | Visual Examination of Nuclear Power Plants |
| BF-UT-17, Revision 0 | Ultrasonic Examination of Nuclear Power Plant Piping |
| N-RT-1, Revision 0 | Radiographic Examination of Nuclear Power Plant Components |

N-MT-1, Revision 3

Magnetic Particle Examination of
Nuclear Power Plant Components

N-PT-1, Revision 5

Liquid Penetrant Examination
Using the Color Contrast Solvent
Removable Method

The NRC inspector noted that procedure N-RT-1 appeared inadequate in that:

- a. It referenced ASME Boiler and Pressure Vessel Code Sections III and V for requirements but failed to identify the applicable revisions.
- b. In many instances the procedure referenced the above code sections (III and V) for requirements, whereas for ready access and use the requirements would more properly be included in the procedure - as is current industry practice.

The intended application of the above procedure was also unclear.

Relative to the inspector's concern for the procedure the licensee stated that:

- a. The procedure is being used only for training purposes.
- b. Radiography of safety-related welds is performed and evaluated to a contractor's approved procedure, not to N-RT-1.
- c. N-RT-1 is being revised to correct its deficiencies and the revision will be completed by October 1982.
- d. Until such time as the revised procedure is available for use no new Level II examiners will be qualified using the procedure and all radiography evaluated by TVA in the interim is being accomplished by their Level III examiners.

The inspector identified his concern for proper correction and application of the procedure as Unresolved Item 259,260,296/82-22-01, Inadequate Radiographic Procedure. Region II will examine the licensee's proper correction and application of this procedure in a subsequent inspection.

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

9. Inservice Inspection - Data Review and Evaluation (73755B)

The inspector reviewed the ISI Records described below to determine whether these records reflected inspection in accordance with regulatory requirements. See paragraph 8 above for the applicable code.

- a. NDE records for the following class 1 components inspected during the most recent ISI inspection of Unit 3 were reviewed by the inspector:

| <u>Component</u> | <u>Weld No.</u> | <u>Report No.</u> | <u>Component Size</u> |
|--|-----------------|-------------------|--------------------------|
| Reactor Vessel safe end nozzle for mainsteam system | N3A S/E | R-073 | 26" diameter x 1.012" |
| Reactor Vessel safe end nozzle for the feed- water system | N4B | R-072 | 12" diameter x .844" |

The following UT records for the above components were reviewed and found to fulfill regulatory requirements with regard to:

- Examination results and data sheets
 - Examination equipment data
 - Calibration data sheets
 - Examination evaluation data
 - Records of extent of examination
 - Records on deviations from program and procedures including justification for deviations
 - Records on disposition of findings
 - Identification of NDE material such as penetrant, penetrant cleaner, couplant, films, tapes, etc.
 - Qualification records of the examiners
 - Identification and certification of calibration standard
- b. NDE records for the most recent ISI inspection of one pressure retaining weld on the reactor pressure vessel for Unit 3 were examined.

| <u>Weld</u> | <u>Report No.</u> | <u>Length of Weld Inspected</u> |
|-------------------------------|-------------------|---------------------------------|
| Reactor flange to upper-shell | R-046 | 23 ft |

The UT records for the above weld were reviewed for compliance with regulatory requirements with regard to the following:

- Method, extent and technique of examination in accordance with the licensee's ISI program and applicable NDE procedure

- Examination data meet acceptance criteria outlined in the applicable NDE procedure and code
 - Recording, evaluation and disposition of findings comply with the applicable NDE procedure and code requirements
 - Inservice nondestructive examination results are compared with recorded results of prior Section XI examinations
 - Method used for NDE was sufficient to determine the full extent of indication or acceptance
 - Qualification records of the examiners
 - Examination equipment data
 - Calibration data sheets
 - Identification and certification of calibration standard and couplant
- c. NDE records for the most recent ISI inspection of two pressure retaining pipe welds in each of three piping systems for Unit 3 were examined. The welds and applicable ISI reports are as follows:

| <u>Piping System</u> | <u>Report No.</u> | <u>Piping Size</u> | <u>Weld No.</u> |
|-----------------------|-------------------|-----------------------|-----------------|
| Core Spray | R-002 | 12" diameter x .688" | DSCS-3.1 |
| Core Spray | R-003 | 12" diameter x .688" | DSCS-3.2 |
| Reactor Water Cleanup | R-010 | 6" diameter x .432" | DSRWC-3-1A |
| Reactor Water Cleanup | R-011 | 6" diameter x .432" | DSRWC-3-1 |
| Main Steam | R-214 | 26" diameter x 1.012" | KMS-3-57 |
| Recirculation | R-215 | 28" diameter x 1.272" | KR-3-51 |

The UT records for the above welds were reviewed for compliance with regulatory requirements relative to the following:

- The examination unit calibration data sheets show no major deviations between initial and final calibrations
- Collected examination data and any recordable indications are properly recorded to permit accurate evaluation and documentation

- Evaluation of examination data performed by a Level II or Level III examiner
- Evaluation of examination data complies with the procedure
- Evaluation of indicators comply with the criteria of the NDE procedure and ASME Code Section XI
- Qualification records of the examiners are adequate
- Examination equipment data is adequate
- Incomplete examination and results were repeated to permit full evaluation
- Identification and certification of calibration standard and couplant are satisfactory

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