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

Report No. 50-260/80-28

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

Facility Name: Browns Ferry

Docket No. 50-260

License No. DPR-52

Inspection at Browns Ferry site near Decatur, AL

Inspector: E. H. Girard — 10/10/80
E. H. Girard — Date Signed

Approved by: A. R. Herdt — 10/14/80
A. R. Herdt, Section Chief, RCES Branch — Date Signed

SUMMARY

Inspection on September 16-22, 1980

Areas Inspected

This routine, announced inspection involved 51 inspector-hours onsite in the areas of IE Bulletin 80-07 and 80-13, review of inservice inspection procedures, and obs rvation of inservice inspection work.

Results

Of the three areas inspected, no items of noncompliance were identified in one area; one item of noncompliance was found in two areas (Infraction - Inadequate liquid penetrant examination - paragraphs 6 and 7); and no deviations were found.

DETAILS

1. Licensee Persons Contacted

Licensee Employees

*H. L. Abercrombie, Plant Manager
J. L. Harness, Assistant Plant Manager
G. T. Jones, Outage Director
J. Lewis, Inservice Inspection (ISI), Coordinator
*R. Daniel, Baseline and ISI Section Head
*M. Gothard, Baseline and ISI Section
M. E. Koss, Metallurgical Engineer
J. F. Fox, Metallurgical Engineer
S. Arnwine, Engineering Associate

Other licensee employees contacted included eight NDE technicians, two security force members, and four office personnel.

Other Organizations

C. Manzari, Hartford Steam Boiler

NRC Resident Inspectors

J. Chase
G. Paulk

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized in a telephone conversation on September 22, 1980, with those persons indicated in Paragraph 1 above.

3. Licensee Action on Previous Inspection Findings

Not inspected.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Status of Inspection and Enforcement Bulletins (IEBs)

a. (Open) IEB 80-BU-07 with Supplement No. 1: BWR jet pump assembly failure. The NRC inspector reviewed the licensee's instruction MMI 14.3-A (8/26/80) to verify that it adequately addressed the visual and ultrasonic examination (UT) requirements specified by IEB 80-07. In

addition, portions of the visual examination were observed by the inspector (both directly and on videotape) for compliance with IEB 80-07. The inspector also examined the data reports of the examinations for this Bulletin which were as yet unapproved. During the visual observations the inspector was shown a jet pump nozzle ring (on Jet Pump No. 1) and the ring's standoff legs which displayed evidence of erosion. The erosion consisted of groves and pits on the order of a few tens of mils deep. The grooves appeared to lie in the direction of the circumference of the ring and along the length of one leg. The inspector did not note any pattern in the location of pits. The erosion was not considered severe. The licensee stated that the condition had not been observed in a previous examination of the Unit 1 jet pumps. They noted, however, that the inspection equipment and technique for the work had been improved since the Unit 1 examination and that they might not have been capable of discerning the condition in the Unit 1 examination. The licensee agreed to address the erosion in their examination report and stated that the condition would be monitored in future outages. The NRC inspector informed the licensee that this would be an inspector follow-up item, identified as 260/80-28-02, "Erosion of Jet Pump Nozzle Ring".

Pending completion of IEB 80-07 requirements, this Bulletin will remain open. No items of noncompliance or deviations were identified.

b. (Open) IEB 80-BU-13: Cracking in core spray spargers.

The inspector reviewed the licensee's instruction for the visual examination specified by IEB 80-13 and reviewed videotapes of the work to verify compliance with the requirements of the Bulletin. The instruction reviewed was identified as MMI 14.3-A (8/26/80). The licensee demonstrated their ability to discern cracks by viewing cracks in a pre-cracked sample suspended in the fuel pool. A crack in the sample (which the licensee stated was one mil wide) was clearly visible to the NRC inspector in his review of videotape of the demonstration. Pending licensee completion of IEB 80-13 requirements, the Bulletin will remain open. No items of noncompliance or deviations were identified.

6. Inservice Inspection - Review of Procedures

The FSAR identifies the code for the inservice inspection (ISI) program as "closely following the 1971 Edition, Summer 1971 Addenda of ASME Section XI in the areas of extent of examination, the methods of examination and the frequency of examination". However, it identifies the procedure requirements for liquid penetrant examination (PT) and ultrasonic examination (UT) as conforming to Appendix IX of the 1968 Edition of ASME Section III. The NRC inspector reviewed a UT procedure and a PT procedure utilized in the licensee's ISI program for compliance with regulatory requirements and licensee commitments. The procedures reviewed and the specific areas addressed in the reviews are described below:

a. UT Procedure: N-UT-1, Rev. 4

Areas addressed in the NRC inspector's review:

(1) Procedure approval

(2) Qualification requirements for NDE personnel

(3) Technical Content (including type of apparatus, extent of coverage, beam angles, scanning techniques, calibration requirements, search units, DAC curves, method of demonstrating penetration, reference level for monitoring discontinuities, levels for evaluation and recording indications, and acceptance criteria).

(4) Records requirements

b. PT Procedure: N-PT-1, Rev. 2

Areas addressed in the NRC inspector's review:

(1) Procedure approval

(2) NDE personnel qualification requirements

(3) Technical content (including consistency with ASME Code requirements, brand names of penetrant materials specified, analysis for sulfur and halogen content, pre-examination surface preparation methods, minimum drying time after solvent cleaning, method of penetrant application, penetration time, permissible surface temperature, penetrant removal method, surface drying prior to developing, type of developer and application method, examination and evaluation technique, acceptance standards, and procedure requalification requirements)

(4) Records requirements

The NRC inspector also reviewed the licensee's Surveillance Instruction 4.6.G which describes their ISI program to verify that method and extent of examination were being specified in accordance with ASME Section XI.

In discusssions with the licensee, the NRC inspector was informed that mechanical methods were sometimes used to clean welds prior to PT's. Instructions for mechanical cleaning (grinding, power brushing, polishing, etc.) were not provided in the licensee's PT procedure for ISI (N-PT-1). In observing a PT on weld TRHR-2-191 the NRC inspector noted that precleaning to remove UT couplant was required. The cleaning method described in the PT procedure proved unsatisfactory and another (unspecified) method was used by the licensee. IX-368 of ASME Section III (1968 Edition) requires a written examination procedure for PT which

provides "details of the method of pre-examination cleaning". Further, the Code (IX-368) also requires requalification of a procedure for any change in pre-examination cleaning method. The absence of instructions for (qualified) mechanical cleaning and for (qualified) cleaning of couplant from welds requiring PT is considered an example of noncompliance in the area of PT. A further example is described in paragraph 7 below. This noncompliance was identified to the licensee as infraction 260/80-28-01, "Inadequate Liquid Penetrant Examination".

Within the areas examined, no items of noncompliance or deviations were identified except for the infraction noted above.

7. Inservice Inspection - Observation of Work and Work Activities

The inspector observed the ISI activities to determine their conformance with regulatory requirements and licensee procedures. See paragraph 5 for the applicable codes and procedures. The specific areas observed by the inspector are described below:

a. Personnel qualification records were reviewed for one Level I, three Level II's and one Level III examiner.

b. Shear wave UT examination of welds THPCI-2-65 and DSHS-2-19 were observed for use of approved procedure (N-UT-1) and specified equipment, examination personnel knowledgeable of requirements and properly qualified, data properly recorded, and conformance with procedure technical attributes (apparatus, coverage, scanning rate, calibration, search unit size and frequency, beam angles, DAC curve, and reference levels and recording method).

c. Visual examination of weld THPCI-2-65 (as specified in UT procedure N-UT-1 Rev. 4 and the FSAR) was observed for proper method, lighting, surface cleanliness and review of results.

d. PT examination of weld TRHR-2-191 was observed for use of approved procedure (N-PT-1) and specified equipment, personnel knowledgeable in requirments and properly qualified, and conformance with procedure technical attributes (penetrant material identification and analysis, acceptable pre-examination surface preparation, drying time after solvent cleaning, penetrant application method and drying time, temperature of examination surface, penetrant removal method and subsequent drying, developer type and application, examination technique and time, evaluation, and requalification requirements).

The NRC inspector observed that the preparation of the surface of weld TRHR-2-191 for PT did not comply with the requirements of the licensee's procedure in the following areas:

(1) The licensee's procedure requires that the surface to be examined be cleaned of paint, slag, or any other masking material prior to penetrant application. The licensee's examiner did not remove paint marking or small amounts of slag and other masking materials from the examination surface prior to the penetrant application.

(2) The procedure requires that "all welds shall blend smoothly into the parent metal". The weld examined did not blend smoothly into the parent metal. The penetrant removal techniques employed by the examiner during the PT examination failed to adequately remove the penetrant from the unblended weld/parent metal transition area and it bled out during developer application.

The failures to comply with PT examination procedure requirements described above and the inadequacies in the procedure described in paragraph 6 are considered to be in noncompliance with Criterion V of 10 CFR 50 Appendix B. The licensee was informed that the noncompliance would be an infraction, identified as 260/80-28-01, "Inadequate Liquid Penetrant Examination".

Within the areas examined, no items of noncompliance or deviations were identified, except for the infraction described above.