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

Report Nos. 50-259/82-40, 50-260/82-40, and 50-296/82-40

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 AL

Inspector: _____ 12/30/82
for J. L. Coley Date Signed

Accompanying Personnel: E. H. Girard (Assisted during week of November 30 thru December 3, 1982 only)

Approved by: _____ 12/30/82
J. J. Blake, Section Chief Date Signed
Engineering Program Branch
Division of Engineering and Operational Programs

SUMMARY

Inspection on November 22-24, and November 30 thru December 3, 1982

Areas Inspected

This special announced inspection involved 101 inspector-hours on site in the areas of IE Bulletin 82-03, Revision 1; observation of inservice inspection work and work activities; review of procedure; and data review and evaluation. In addition, during the week of November 30 thru December 3, 1982, Region II personnel performed independent ultrasonic examination of selected welds.

Results

Of the four areas inspected, no violations or deviations were identified.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*G. Jones, Plant Superintendent
**E. Ennis, Assistant Plant Superintendent
**L. Parvin, Assistant QA Supervisor
***T. Chinn, Compliance Supervisor
**J. Fergison, Assistance Outage Director
*T. Schreeder, ISI Level III Examiner

*Attended exit interview on December 3, 1982
**Attended exit interview on November 24, 1982
***Attended exit interview on December 3, and November 24, 1982

Other licensee employees contacted included construction craftsmen, technicians operators, and office personnel.

Other Organizations

D. MacGill, Level III Examiner, Lambert, MacGill & Thomas Inc.

NRC Resident Inspector

*G. Paulk

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on November 24 and December 3, 1982, with those persons indicated in paragraph 1 above. The inspectors described the area inspected and discussed in detail the inspection findings. No dissenting comments were received from the licensee.

3. Licensee Action on Previous Enforcement Matters

Not inspected.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. IE Bulletin 82-03 (Unit 2) (92703B)

(Open) IEB-BU-03, Stress Corrosion Cracking in Thick-Wall, Large-Diameter Stainless Steel, Recirculation System Piping at BWR Plants. Recently intergranular stress corrosion cracking (IGSCC) was found in large diameter, thick wall, stainless steel recirculation piping at the Unit 1 Nine Mile Point Plant (NMP). In order to provide some assurance that inspections which are currently being performed or scheduled to be performed are sufficient to detect IGSCC in recirculation system piping, the Electric Power Research Institute (EPRI) arranged to have samples of the NMP recirculation system piping containing IGSCC available at Battelle Memorial Institute in Columbus, Ohio, for industry demonstration of UT methodoloy. As a result of the above, TVA contracted the Lambert, MacGill and Thomas (LMT) inspection agency who had successfully demonstrated their techniques at Battelle Memorial Institute on October 8, 1982, to perform the UT inspections of the stainless steel recirculation system piping. The ISI inspection on Unit 2 was started on November 17, 1982, and was completed on November 30, 1982, by LMT.

The inspector examined the ISI activities described below to determine whether activities being performed were consistent with those previously demonstrated as being effective for detecting IGSCC. Inspection of the recirculation system piping was performed in accordance with the ASME B&PV Code Section XI (77S78) as modified by techniques demonstrated on the NMP blocks at Battelle. During the week of November 22-24, 1982, the inspector observed the following ISI activities:

a. Review of Inservice Inspection Procedures (73052)

The ISI inspection of Unit 2 was performed using LMT procedure UT-10, Revision 11. The inspector reviewed this procedure to ascertain whether the procedure was approved, and to determine if the technical content contained the following information pertinent to the piping to be examined:

(1) The type of apparatus to be used.

(2) The extent of coverage (scanning surface, scanning rate and directions) as well as the scanning techniques are specified and are consistent with the ASME Code and Regulatory requirements.

(3) Calibration requirements, methods and frequency including type, size, and material of calibration blocks as well as location and size of calibration reflectors within the block are clearly specified and consistent with the applicable ASME Code and regulatory requirements.

(4) The sizes and frequencies of search units are specified and are consistent with those demonstrated on the NMP blocks.

(5) Beam angle or angles are specified and are consistent with the ASME Code or those demonstrated at Battelle.

(6) The reference level for monitoring discontinuities was defined and the scanning gain setting specified and that these values were in accordance with those demonstrated on the NMP blocks.

(7) Methods of demonstrating penetration was established.

(8) Levels or limits for evaluation and recording of indications were specified and were in accordance with those determined to be adequate on the NMP blocks.

(9) Method of recording significant indications was established and the reporting requirements were in accordance with licensee requirements.

(10) Acceptance limits were specified or referenced and were in accordance with the ASME Code, Section XI.

Within the areas described above, no violations or deviations were observed.

b. Observation of Work and Work Activities (73753B) (Unit 2)

The inspector observed LMT perform the following in-process ultrasonic examinations (UT) including calibrations for the recirculation system piping examined.

Weld No.	Size	Drawing No.
GR-2-27	28" Dia	CH-M-2068-C
KR-2-24	28" Dia	CH-M-2068-C
KR-2-51	28" Dia	CH-M-2068-C
DSRHR-2-7	24" Dia	CH-M-2068-C
DSRHR-2-4A	24" Dia	CH-M-2068-C
KR-2-15	22" Dia	CH-M-2068-C
KR-2-37	22" Dia	CH-M-2068-C

While observing the above welds the inspector noted the following three areas of concern:

(1) The inspection of the code required 12" of longitudinal weld on pipe at the intersection of circumferential weld were not being accomplished. LMT was not inspecting these welds because TVA did not have them listed in their ISI program. TVA's UT Procedure No. N-UT-18 would require inspection of this additional weld; however, TVA failed to insure that LMT's UT procedure also included this code requirement. TVA immediately included these welds for all inspection performed after November 22, 1982. In addition TVA committed to inspect all longitudinal welds not previously examined if UT identified any indications on the longitudinal welds inspected.

Region II accepted this as adequate corrective action based on the following:

(a) The IE Bulletin does not specifically address longitudinal welds.

(b) The recirculation system header pipe which would include the longitudinal welds were probably solution annealed during their fabrication since this is an industry practice (however, documentation did not confirm this).

(c) There was no history of IGSCC in longitudinal welds.

(2) The inspector also questioned the scanning speed, which when timed appeared excessive. The LMT Level III examiner had the scanning speed reduced and reinspected all areas of the weld joints that the inspector had questioned. The results of the scans were nearly identical to the initial scans.

(3) The inspector also questioned the sample of welds TVA had selected, in particular the recirculation end caps that were not on the inspection plan since these welds have a history of IGSCC. TVA agreed to inspect these two additional welds. No IGSCC were detected by LMT in either weld of the weld joints.

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

c. ISI Data Review and Evaluation (73755B)

The inspector reviewed the UT reports, strip charts and calibration sheets for the weld joints listed below to determine if the following were being met:

(1) The examination calibration data sheets show no major deviations between initial and final calibrations.

(2) Collected examination data and recordable indications are properly recorded to permit accurate evaluation and documentation.

(3) Evaluation of examination data was performed by a Level III or Level II examiner.

(4) Evaluation of examination data complies with the procedure.

(5) Evaluation of indicators comply with the criteria of the NDE procedure and ASME Section XI.

(6) Incomplete examinations and results were repeated to permit full evaluation.

The following weld reports were reviewed by the inspector:

Weld No.	Joint Size	Report No.
GR-2-53	28" Diameter	No. 17
N-1-A	28" Diameter	No. 18
N-1-B	28" Diameter	No. 16
DSRHR Pipe To Elbow	24" Diameter	No. 15
N-2-G Safe End to Nozzle	12" Diameter	No. 14

Within the areas inspected, no violations or deviation were observed.

6. Independent Inspection Effort - (92706B) (Unit 2)

During the week of November 30 thru December 3, 1982, NRC inspectors, using Region II UT equipment, performed independent examinations on the following welds:

Weld No.	Location of Weld	Remarks
KR-2-37	End cap to Header Weld	Indication @ 10:00 licensee evaluated as Geometry
KR-2-15	End cap to Header Weld	No indications noted
KR-2-36	Saddle Weld to Header Limited Inspection (12:00 to 5:30)	Indications observed requiring additional evaluation @ 1:30, @ 3:30, @ 4:30

The inspectors observed that the ultrasonic signals from the indications on weld joint No. KR-2-36, were characteristic of the UT signals from IGSCC cracks. This was particularly true for the indication at the 4:30 o'clock position. (This weld was not a weld that had been inspected by the licensee; it was selected for cursory examination by NRC because of its proximity to weld KR-2-15). NRC's UT inspection time was limited due to high radiation exposure to the inspectors, so there was insufficient time for NRC to completely evaluate this weld. The licensee agreed to examine weld KR-2-36 and complete the evaluation.

On December 8, 1982, the inspectors were informed by telephone from Mr. D. A. Howard, NDE Supervisor for TVA's Inservice Inspection Group that TVA's Level III examiner had evaluated the indications at 3:30 and 4:30 on weld joint KR-2-36 and concurred with the inspectors preliminary findings that the signals observed were characteristics of crack-type indications. The licensee also informed the inspectors that since neither NRC nor TVA had been certified on the NMP blocks, TVA had requested LMT to return and make the official interpretation. LMT was to perform their examination on December 10, 1982. TVA also stated that if LMT confirmed these indications as crack, TVA would expand their ISI inspection.

Within the areas examined no violations or deviations were observed.