UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

Report Nos.: 50-259/91-32, 50-260/91-32, and 50-296/91-32

Licensee: Tennessee Valley Authority
6N 38A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Docket Nos.: 50-259, 50-260 and 50-296 License Nos.: DPR-33, DPR-52, and DPR-68

Facility Name: Browns Ferry 1, 2, and 3

Inspection Conducted: September 9-13, 1991

Inspector: J. L. Coley 10-4-91
J. L. Coley Date Signed

Approved by: J. D. Blake 10/7/91
J. D. Blake, Chief Date Signed
Materials and Processes Section
Engineering Branch
Division of Reactor Safety

SUMMARY

Scope:

This special, announced inspection was conducted in the area of inservice inspection (ISI) (1) review of TVA's Unit 2, 90-Day ISI Summary Report and site followup of inconsistencies noted during the review of this report, and (2) discussions with TVA Management concerning their plans to perform automated ultrasonic (UT) invessel ISI examinations on Units 2 and 3.

Results:

In the areas inspected, violations or deviations were not identified. TVA was very helpful in assisting the inspector resolve the programmatic questions identified. Management was involved in assuring quality as noted by management's attendance in meetings to address the inspectors concerns.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*T. Abney, Unit 3, Technical Support Manager
*R. Baron, Quality Control (QC) Manager
*G. Belew, ISI Supervisor, ISI Programs Section
*P. Carier, Site Licensing Manager
*L. Clardy, Monitoring Supervisor, Site Quality Assurance (QA)
*J. Corey, Radcon Manager
*F. Frocello, ISI Supervisor, Site QA
*K. Groom, Modification Engineer
*E. Hartwig, Unit 3 Project Manager
*M. Herrell, Plant Operations Manager
*T. Knuettel, Unit 3 Licensing Engineer
*J. McCarthy, Unit 3 Licensing Manager
*D. Massey, Regulatory Licensing Engineer
*J. Rupert, Engineering Manager
*J. Sabados, Chemistry and Environmental Superintendent
*J. Simmons, Technical Specialist, ISI Programs Section
*J. Swindell, Unit 3 Restart, Operations Manager
*J. Whitaker, TVA Level III Examiner

Other licensee employees contacted during this inspection included engineers, technicians, and administrative personnel.

Other Organizations

R. Seals, Project Manager, General Electric

NRC Resident Inspectors

*C. Patterson, Senior Resident Inspector
*W. Bearden, Resident Inspector
*E. Christnot, Resident Inspector
*K. Ivey, Resident Inspector

*Attended exit interview

2. Review of TVA's 90-Day Summary Report for Browns Ferry Unit 2 (73755)

During the week of September 3-6, 1991 the inspector performed an in office review of the Browns Ferry Unit 2 cycle 5, ISI 90-day summary report. This report contained a historical record of the Unit 2 ASME Code Class 1 and 2 equivalent components for: (1) repairs and replacements that were performed from September 15, 1984, through June 27, 1991, in accordance with the ASME Boiler and Pressure Vessel (B&PV) Code,

Section XI, 1980 Edition through Winter 1981 Addenda, and (2) inservice inspection nondestructive examinations that were performed February 26, 1986 through May 24, 1991, to satisfy the 120-month inspection cycle requirement in accordance with the ASME B&PV Code, Section XI, 1974 Edition through Summer 1975 Addenda. This summary report was provided to NRC's Region II Office in accordance with paragraph IWA-6220 and 6230 of ASME B&PV Code, Section XI, 1974 Edition through Summer 1975.

The inspector's review of TVA's summary report revealed a number of inconsistencies that were not documented in enough detail for the inspector to concluded that proper examinations or component testing had been performed. Therefore, the inspector notified the licensee that an onsite review of ISI records and interviews with the appropriate personnel would be necessary. Items identified by the inspector as having inconsistencies or inadequate information to determine the acceptability of the components were as follows:

a. NRC Regulatory Guide 1.150, "Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations", was not listed as an augmented inspection in the 90-day summary report for the Unit 2 reactor vessel examinations.

b. The 90-day summary report did not indicate that intersecting longitudinal welds in piping and fittings had been examined in accordance with Section XI, of the ASME Code.

c. NIS-2 Forms used by the licensee for reporting Section XI examinations of components, lacked sufficient information for the inspector to determine whether 14 welds had been UT tested for minimum wall thickness after removal of indications reported during ISI examinations.

d. The 90-day summary report listed different hydrostatics pressure test values for identical replacement Control Rod Drive H_2O Accumulators ranging from 1925 PSI, 1525 PSI, 1125 PSI to no test performed.

e. Numerous NIS-2 Forms were unsigned by the code inspector in the 90-day summary report.

f. Support No. H-31 in work plan 2070-84 was identified as having no physical work accomplished on it. However, a note at the bottom stated that Discrepancy Report No. DR-85149 was issued on H-31 because the code inspector had failed to witness the work.

The licensee provided site personnel, and programs and replacement specialists from Chattanooga to assist the inspector in determining whether the components in question were adequately examined prior to being placed inservice. As a result of several technical meetings with the licensee and indepth reviews of records and procedures the following conclusions were reached for the items identified by the inspector above:

(1) Regulatory Guide 1.150 states that: Except in those cases in which an applicant proposes an acceptable alternative method for complying with specified portions of the commission's regulations, the methods described here in (Reg Guide 1.150) will be used in the evaluation of 1) the results of inservice examination programs of all operating reactors after July 15, 1981, and 2) the results of preservice program of all reactors under construction performed after January 15, 1982. In 1987, TVA developed a position on Regulatory Guide 1.150 that stated it would be used by TVA for automated in vessel examinations of PWR reactor vessels, but not for the BWR OD manual examinations of vessels at Browns Ferry. The reasons given by TVA for not implementing the Reg. Guide at Browns Ferry was 1) that Regulatory Guides are not regulations and compliance with them is not required, 2) all examinations performed on reactor vessels at Browns Ferry in the past were performed manually from the outside diameter utilizing procedures which would record any suspicious indication regardless of amplitude. However, on January 4, 1989 TVA's ultrasonic procedure for OD manual UT examination of the reactor vessel was revised to include the requirements of Regulatory Guide 1.150 and this procedure will be used to perform the Unit 3 vessel examinations that will be performed this outage. Unit 2 vessel examinations were not performed using Reg. Guide 1.150. However, if NRC's Rule for 100% automated vessel inspection is implemented on January 1, 1992 as expected by the industry, Unit 2 and Unit 3 will have to be inspected again from the inside of the vessel during the first period of the 2nd interval. TVA has adopted this Reg. Guide for all examinations in future cycles which are conducted from inside the vessel utilizing automated devices. The inspector concluded that pending the in vessel examinations on Unit 2 in the next refueling outage this Reg. Guide has been implemented by TVA.

(2) The ASME B&PV Code, Section XI, 1974 Edition through Summer 1975 requires that intersecting longitudinal welds in Class 1 and 2 piping and components be examined. TVA did not list any longitudinal welds as having been examined in their 90 day summary report with the exception of the reactor vessel welds. The inspector held discussions with TVA's cognizant ISI supervisor and TVA's Level III examiner and discovered that TVA does not assign weld identification to the longitudinal welds however, ultrasonic procedures reviewed by the inspector revealed that these examination were prescribed therein. A review of ISI examination records verified that the procedures were being implemented correctly. This item was considered satisfactory addressed by the licensee.

(3) ASME Code Forms (NIS-2) used by the licensee for reporting Section XI examination of components, lacked sufficient information for the inspector to determine whether 14 welds had

been ultrasonically tested for minimum wall thickness after removal of reported indications. The inspector held discussions with the ISI supervisor and TVA's Level III examiner and reviewed maintenance packages and examination reports for the welds in question. The results of this review revealed that several of the welds had been UT examined for minimum wall thickness and had not been reported. Other welds had been repaired in the weld re-enforcement and the size of the weld re-enforcement had not been reduced below its minimum physical size therefore, UT was not required. The third category of repairs dealt with base material repairs that had not exceeded 1/32 inch. TVA Procedure SDSP-13.1 Appendix U allows minor fabrication damage (less than 1/32 inch) to be removed as directed by the responsible engineer and that these repairs need not be documented. TVA examiners do however mechanically measure the depth of the grindout and subtract this depth from the nominal wall thickness to determine the remaining wall thickness. If this value is satisfactory the examiner documents his examination by stating that no significant metal was removed. The inspector's review revealed that supporting documentation for all the welds identified, did have an examination whether visual, mechanical, or ultrasonic to determine minimum wall thickness was not violated.

(4) TVA's 90-day summary report listed different hydrostatic pressure test valves for identical replacement Control Rod Drive H_2O Accumulators. These pressure difference ranged from 1925 PSI, 1525 PSI, 1125 PSI to no test performed as documented on the NIS-2 Form. The specialist explanation for the different hydrostatic pressures listed on the NIS-2 Forms was that SDSP-13.3 had been changed several times during the procurement of the accumulator vessels and the instructions in place at the time of the procurement of an accumulator was documented on the NIS-2 Form. The inspector verified that the accumulators in question had received a hydrostatic test which was performed by the vendor at a test pressure much higher than any of the pressures listed above. In addition the pressure vessels and their flanged joints had received a post maintenance test at operational pressure.

(5) Numerous NIS-2 Forms were unsigned by the Code inspector in the 90-day summary report. The inspector missed during his in-office review that the code inspector had signed a NIS-2 Form attesting that he had reviewed all of the NIS-2 Forms in the 90-day summary report.

(6) Support H-31 in work plan 2070-84 was identified as having no physical work accomplished on it. However, the documentation also stated that a discrepancy report had been issued on the support for not having the code inspector witness the work. The

inspector's review of this item revealed that there was a number of supports in the work plan and that some of these supports had been worked on before the code inspector had reviewed the work plan. However, H-31 did not have any physical work accomplished on it. The scope of the work performed on H-31 was to take as-built measurements for design.

As a result of the inspector's review it was apparent to the licensee that a better job of documentation would be required for subsequent submittals in order that the 90-day summary report would be auditable by NRC. However, this was the first time TVA had used the NIS-2 Form and some inconsistences were to be expected. TVA management assured the inspector that subsequent submittals will be reviewed to a much greater extent to ensure the accuracy and continuity of the documentation.

Within the areas examined, no violation or deviation was identified.

3. Review of TVA's Plans for Automated Ultrasonic In-vessel Examinations on Unit 2 and 3 Reactor Pressure Vessels

The inspector held discussions with TVA Management to determine when TVA was going to perform the automated UT invessel examinations of the reactor vessel welds for Units 2 and 3 and what steps TVA has taken to date. The following is a summary of the information received by the inspector:

* TVA expects the rule for invessel inspection to be invoked by NRR on January 1, 1992. The rule will allow licensee's who have less than forty months left in their present interval to perform the automated invessel UT examinations in the first 33 months of the first period of the next interval. The first interval for BFNP Unit 2 will be over on May 24, 1992. The first interval for BFNP Unit 3 will be over one year after startup. TVA intends to examine both Units in the first period of the 2nd Interval.

* TVA considers the automated invessel equipment to be developmental at this point and they do not want to experience delays to their scheduled similar to those experienced at Monticello during their automated invessel examinations.

* TVA is also reluctant to spend over a million dollars on these examinations prior to startup. TVA intends to perform the UT examinations on Unit 3 this outage manually from the vessel OD as they have committed in their ISI program.

* TVA has performed accessibility studies on Unit 2. These studies revealed that 86% of the welds are accessible for examination, 78% are fully accessible, and 91% of the welds could be examined by performing the lower weld from the OD of the vessel.

* TVA has also contracted General Electric (GE) to perform accessibility studies on Unit 3 this outage..

* TVA is presently in the process of contracting GE to provide as-built drawings for all three units at BFNP.

* GE and Southwest Research Institute (SWRI) have both had information meetings with TVA to discuss how their systems could be used to perform these examinations.

* TVA will be sending personnel to SWRI in September and to GE in October to witness both vendors used their systems to perform invessel examination in a mockup vessel at their laboratories.

* GE has notified all BWR licensees that there will be a 4 month delay after a order is placed with them by a licensee in order to design a ring for the UT scanner for each vessel flange.

As a result of the discussions delineated above it was apparent that TVA is keeping abreast of the technology available to perform the examinations and has definite plans as to when this technology will be used. However, NRC views the nearly two years that TVA will be in the present outage as TVA's best window for performing the automated examinations on the Unit 3 reactor vessel. The licensee was made fully aware of NRC's concern and further discussions on this matter, with TVA and NRC management are certain.

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

4. Exit Interview

The inspection scope and results were summarized on September 13, 1991, with those persons indicated in paragraph 1. The inspector described the areas inspected and discussed in detail the inspection results. Proprietary information is not contained in this report. Dissenting comments were not received from the licensee.