



U.S. Nuclear Regulatory Commission  
Page 2  
February 14, 2003

As stated in TVA's letter dated May 24, 2002, these are the final requests for relief for the BFN Unit 2 ASME Section XI, Second Ten-year Inservice Inspection Interval that ended May 24, 2001.

There are no new commitments contained in this letter. If you have any questions, please contact me at (256) 729-2636.

Sincerely,

original signed by:

T. E. Abney  
Manager of Licensing  
and Industry Affairs

Enclosure

cc (Enclosure):

(Via NRC Electronic Distribution)

Mr. Stephen J. Cahill, Branch Chief  
U.S. Nuclear Regulatory Commission  
Region II  
Sam Nunn Atlanta Federal Center  
61 Forsyth Street, SW, Suite 23T85  
Atlanta, Georgia 30303-8931

NRC Resident Inspector  
Browns Ferry Nuclear Plant  
10833 Shaw Road  
Athens, Alabama 35611-6970

Mr. Kahtan N. Jabbour, Senior Project Manager  
U.S. Nuclear Regulatory Commission  
One White Flint, North  
(MS 08G9)  
11555 Rockville Pike  
Rockville, Maryland 20852-2739

U.S. Nuclear Regulatory Commission  
Page 3  
February 14, 2003

JWD:DTL:BAB

Enclosure

cc (Enclosure):

- A. S. Bhatnagar, PAB 1E-BFN
- M. J. Burzynski, BR 4X-C
- R. G. Jones, POB 2C-BFN
- A. L. Ladd, PEC-2A-BFN
- J. E. Maddox, LP 6A-C
- D. C. Olcsvary, LP 6A-C
- C. M. Root, PAB 1G-BFN
- J. R. Rupert, LP 6A-C
- K. W. Singer, LP 6A-C
- E. J. Vigluicci, ET 11A-K
- R. E. Wiggall, PEC 2A-BFN
- NSRB Support, LP 5M-C
- EDMS-K

s:\lic\submit\subs\Unit 2 ASME RFR 2-ISI-6, 13. 14, & 15 RAI Response.doc

## ENCLOSURE

TENNESSEE VALLEY AUTHORITY  
BROWNS FERRY NUCLEAR PLANT (BFN)  
UNIT 2  
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) SECTION XI,  
INSERVICE INSPECTION (ISI) PROGRAM  
(SECOND TEN-YEAR INSPECTION INTERVAL), REQUESTS FOR RELIEF  
2-ISI-6, REVISION 2, 2-ISI-13, 2-ISI-14, AND 2-ISI-15

RESPONSE TO NRC QUESTIONS

---

During its review of BFN Unit 2 requests for relief 2-ISI-6, Revision 2, 2-ISI-13, 2-ISI-14, and 2-ISI-15 the NRC staff identified questions regarding TVA's proposed alternate examinations. TVA and the NRC staff held several teleconferences to discuss the staff's questions. As a result of those teleconferences, TVA is providing clarification and additional information regarding the proposed alternative examinations stated in the requests for relief. Listed below are the specific NRC questions and the corresponding TVA response.

### NRC Question

Relief requests 2-ISI-6 and 2-ISI-13 seek relief for nine reactor pressure vessel (RPV) nozzle-to-vessel full penetration welds and for the RPV standby liquid control nozzle inside radius section, respectively. The proposed examination of the nine RPV nozzle to vessel welds is to be performed using ultrasonic examination from the outside of the vessel. The percent coverage for these nozzles is 56 to 72 percent. The proposed examination of RPV standby liquid control nozzle inside radius is to be visual (VT-2) examination in conjunction with the Class 1 system leakage test. The Advanced Inservice Reactor Inspection System 21 device (AIRIS 21) and Enhanced Data acquisition System-II equipment (EDAS<sup>TM</sup>-II) is used to ultrasonically inspect longitudinal shell welds from the inside surface of the RPV.

Identify the percent of coverage for flaws located at the clad and nozzle weld interface when ultrasonic examination is performed in accordance with request for relief 2-ISI-6.

### TVA Response

The percentage of examination coverage for flaws located at the clad and nozzle weld interface are approximated as follows:

Nozzles N-2D, N-2E, and N-2K - The clad and nozzle weld interface was examined utilizing an automated UT system and manual UT techniques at areas where the automated system was limited. Clad and nozzle weld interface examination coverage is approximately 62.5 percent.

Nozzles N-3A, and N-3C - The nozzle to shell weld was examined utilizing manual UT. Clad and nozzle weld interface examination coverage is approximately 68.7 percent.

Nozzles N-4D, and N-4E - The cladding has been removed from the feed water nozzles in accordance with NUREG-0619, "BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle Cracking" requirements.

Nozzle N-8B - The nozzle to shell weld was examined utilizing manual UT. Clad and nozzle weld interface percent coverage is approximately 75 percent.

Nozzle N-10 - The nozzle to shell weld was examined utilizing manual UT. Clad and nozzle weld interface examination coverage is approximately 50 percent.

### **NRC Question**

Explain why the AIRIS 21 and EDAS<sup>TM</sup>-II can not be utilized for examination of the welds and inside radius section discussed in request for relief 2-ISI-6 and 2-ISI-13.

### **TVA Response**

The configuration of the vessel and internal piping prevents access with an automated system as follows:

Nozzles N-2D, N2-E, N-2K, N-4D, N4-E, N-8B - Inaccessible due to piping and spargers.

Nozzle N-10 - Inaccessible due to core shroud plate.

Nozzles N-3A, and N-3C - These nozzles are accessible but the technology has not been developed to perform the examination from the vessel ID for BWRs.

### **NRC Question**

Identify the increase in NDE examination coverage expected if the AIRIS 21 and EDAS<sup>TM</sup>-II equipment can be utilized for ultrasonic examination.

### **TVA Response**

As described above, the configuration of the vessel and internal piping prevents access with an automated system.

### **NRC Question**

For Relief Request 2-ISI-15 the licensee identified Code Case N-577, "Risk-Informed Requirements for Class 1, 2, or 3 Piping, Method A," as being the applicable Code requirement. The NRC has not approved this Code Case for use. However, N-577 does serve as a reference to relate the IGSCC welds, which fall under Browns Ferry's risk-informed ISI (RI-ISI) program, back to the true Code requirement, which is IWB-2500, Table IWB 2500-1, Figure IWB-2500-8(c). Therefore, relief should be requested from the requirement of ASME Code, Section XI, IWB-2500, Table IWB-2500-1. Please indicate which examination categories and item numbers from IWB-2500 apply to these welds (i.e., B-J, B-F, etc.)

### **TVA Response**

TVA received a Safety Evaluation Report (SER) from the NRC dated January 19, 2001 (TAC No. MA8873), "Browns Ferry Nuclear Plant Unit 2, Code Relief For Risk-Informed Inservice Inspection Of Piping Welds." This SER allowed TVA to utilize an alternative Risk-Informed Inservice Inspection (RI-ISI) program for BFN Unit 2. This program was developed in general accordance with the Westinghouse Owners Group (WOG) Topical Report WCAP-14572, Revision 1-NPA-A, which was approved by the NRC staff. This report references the utilization of Code Case N-577 for the examination methods.

The Code requirement is Code Case N-577, N-577-2500, Table 1, Examination Code Category R1.16.

### **NRC Question**

In the licensee's basis for relief in 2-ISI-15 they state:

"Welds GR-2-15(OL) and DRHR-2-03 were examined in April 1999, prior to the Performance Demonstration Initiative (PDI) Program

requirements being mandated by 10 CFR 50.55a(b)(2)(xv)(A)(2), utilizing NDE methods and techniques to the requirements of ASME Section XI Code, 1989 Edition, No Addenda." Is 1989 supposed to read 1986, since that is the applicable Section XI code edition for the relief?

### **TVA Response**

The correct ASME Section XI Code year for NDE is the 1989 Edition. At the time the examination of welds GR-2-15(OL) and DRHR-2-03 were performed the NDE program was to the 1989 Edition of ASME Section XI. The TVA Nuclear (all sites) NDE program was upgraded to the 1989 Edition in 1996. The Code of record for Unit 2 (component selection) is the 1986 Edition. This was referenced in Inservice Inspection Program Unit 2, procedure 2-SI-4.6.G, paragraph 4.1.

### **NRC Question**

For relief request 2-ISI-6, what percentage coverage was obtained for the nozzles in the previous examinations and what was the result of the examinations?

### **TVA Response**

The subject nozzle to RPV vessel welds require examination (UT) in accordance with ASME Section XI, Table IWB-2500-1, Examination Category B-D, Item B3.90 once during each Ten-Year ISI interval. Request for relief 2-ISI-6 Revision 2, addresses RPV nozzle (9 nozzles) examination coverage obtained during Cycle 11 (Spring 2001) of the Unit 2 Second Ten-Year ISI Interval (May 24, 1992 to May 24, 2001). The previous examinations of the subject nozzles were completed during the Unit 2 First Ten-Year ISI Interval (March 1, 1975 to May 24, 1992). Please note that the Unit 2 ISI interval was extended six years since the unit was shutdown from 1985 to 1991.

The examination method (UT) and techniques utilized in the First Ten-Year ISI Interval were basically the same as used in the second Ten-Year ISI interval, therefore, the percentage of examination coverage obtained in the first interval was essentially the same as reported in 2-ISI-6 Revision 2. The examinations performed on the subject welds in both the first and second Ten-Year ISI intervals met the applicable ASME Section XI weld examination acceptance criteria.

**NRC Question**

For relief request 2-ISI-13, when was the SLC nozzle last inspected and what were the results?

**TVA Response**

The SLC nozzle is approximately 2 inches in diameter. The inner radius section of the SLC nozzle is required to be examined in accordance with ASME Section XI, Table IWB-2500-1, Examination Category B-D, Item B3.100 once during each Ten-Year ISI interval. A review of the first Ten-Year ISI interval program shows the nozzle was exempt (i.e., 3-inch and smaller) from examination based on section IWB-1220(b)(1) of the Code of record in effect for the first Ten-Year interval (ASME Section XI, 1974 Edition, Summer 75 Addenda). Therefore, no examination was required, or performed, for the SLC nozzle during the First Ten-Year ISI inspection interval.

However, the SLC nozzle has received a VT-2 (visual) examination in conjunction with the Class I System Leakage Test conducted during each refueling outage of the Second Ten-Year ISI interval. Unit 2 has refueled six times during the second Ten-Year ISI interval. Consequently, the SLC nozzle has undergone six VT-2 (visual) examinations during the second Ten-Year ISI interval. No leakage has been identified during the VT-2 (visual) examinations of the SLC nozzle.

**NRC Question**

For relief request 2-ISI-14, when were the welds last inspected and what were the results?

**TVA Response**

The BFN reactor pressure vessel longitudinal shell welds listed in this relief request were not inspected during the first Ten-Year ISI Interval (March 1, 1975 to May 24, 1992). As a result of improved technology and equipment (i.e., remote examination), a rule change, 10 CFR 50.55a(g)(6)(ii)(A)(2), went into effect on September 8, 1992, that required examination of the reactor pressure vessel shell welds (circumferential\* and longitudinal) using the requirements specified in ASME Section XI, Table IWB-2500-1, Category B-A, Items B1.11 and B1.12 respectively. The examination coverage limitations identified in relief request 2-ISI-14 are a result of the first, and only, examination of the RPV longitudinal (Item B1.12) shell welds.

The RPV shell to flange weld (ASME Section XI, Table IWB-2500-1, Category B-A, Item B1.30) is also included in the scope of this request for relief. The weld was examined during the first Ten-year ISI Interval. The examination method (UT) and techniques utilized in the first interval were basically the same as used in the second interval. Consequently, the percentage of examination coverage obtained in the first interval was essentially the same as reported in 2-ISI-14. The examinations performed on the subject weld in both the First and Second Ten-Year ISI intervals met the applicable ASME Section XI weld examination acceptance criteria.

\*Note: By letter dated September 28, 1995, as supplemented by letters dated June 24 and October 29, 1996, May 16, June 4, June 13, and December 18, 1997, and January 13, 1998, the Boiling Water Reactor Vessel Internals Project (BWRVIP) submitted a report (BWRVIP-05) to the NRC that demonstrated that the RPV circumferential shell welds (ASME Section XI, Table IWB-2500-1, Category B-A, Item B1.11) required zero percent examination. Generic Letter (GL) 98-05 provided individual licensees the guidance for implementing the BWRVIP-05 report. As a result, TVA submitted a request for relief (2-ISI-9) for BFN Unit 2, by letter dated March 24, 2000, that eliminated examination of the RPV circumferential shell welds for the remaining term under the existing operating licensee. TVA's request for relief was approved by NRC letter (TAC No. MA8424) dated August 14, 2000.