



Tennessee Valley Authority, Post Office Box 2000, Decatur, Alabama 35609-2000

December 16, 2003

10 CFR 50.55a(g)(5)(iii)

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop: OWFN P1-35
Washington, D.C. 20555-0001

Gentlemen:

In the Matter of)	Docket No. 50-260
Tennessee Valley Authority)	

BROWNS FERRY NUCLEAR PLANT (BFN) - UNIT 2 - AMERICAN SOCIETY
OF MECHANICAL ENGINEERS (ASME) SECTION XI INSERVICE INSPECTION
(ISI) PROGRAM, REQUEST FOR RELIEF 2-ISI-18 - RESPONSE TO NRC
REQUEST FOR ADDITIONAL INFORMATION

This letter provides TVA's response to an NRC request for additional information regarding BFN Unit 2, ASME Section XI Inservice Inspection (ISI) Program, request for relief 2-ISI-18. The proposed request for relief, which was submitted on June 2, 2003, seeks relief for two austenitic stainless steel welds that had nondestructive (NDE) examination coverage less than 100 percent. The examination limitations were a result of component configuration and a rule change in the code of federal regulations [10 CFR 50.55a(b)(2)(xv)(A)(2)] that restricts taking credit for "single-sided" examinations without completing a "single-sided" ASME Section XI, Appendix VIII demonstration using flaws on the opposite side of the weld. At the time the examinations were performed, no Performance Demonstration Initiative Program existed for examination of "single-sided" austenitic welds.

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U.S. Nuclear Regulatory Commission

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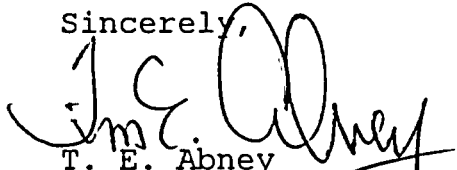
December 16, 2003

During its review of the BFN request for relief, the NRC staff identified questions regarding TVA's request. TVA and the NRC staff held a teleconference to discuss the staff's questions. As a result of that teleconference TVA is providing, in the enclosure, its response to the NRC staff's questions.

As stated in our letter dated June 2, 2003, TVA seeks approval of this relief request by January 5, 2005, to support resource planning for the Unit 2, Cycle 13 (Spring 2005) refueling outage.

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

Sincerely,

A handwritten signature in black ink, appearing to read "T. E. Abney", is written over the typed name and title.

T. E. Abney
Manager of Licensing
and Industry Affairs

Enclosure

cc (Enclosure):

(Via NRC Electronic Distribution)

ENCLOSURE

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
UNIT 2

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
SECTION XI, INSERVICE INSPECTION (ISI) PROGRAM
REQUEST FOR RELIEF 2-ISI-18

RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION

This enclosure provides TVA's response to an NRC request for additional information regarding BFN Unit 2, ASME Section XI, Inservice Inspection (ISI) Program, request for relief 2-ISI-18. The proposed request for relief, which was submitted on June 2, 2003, seeks relief for two austenitic stainless steel welds which had nondestructive (NDE) examination coverage less than 100 percent. Listed below are the NRC questions and the associated TVA response.

NRC Question

Regarding Relief Request (RR) 2-ISI-18, page E1-3 of the June 2, 2003, submittal, under Code Requirement, TVA should clearly state the ASME Code requirements not what WCAP-14572 requires.

TVA Response

Code Requirement: ASME Section XI, 1995 Edition, 1996 Addenda, Examination Category B-J, Item No. B9.11, Figure IWB-2500-8 (c) depicts the required boundaries to achieve 100 percent coverage of the examination volume as referenced in Table 4.1-1 of WCAP-14572, Revision 1-NP-A.

Note: TVA submitted its BFN Unit 2 Risk-Informed ISI Program by letter dated June 1, 2000. In that letter, TVA stipulated the use of the WCAP-14572, Revision 1-NP-A (with deviations) for its Risk Informed Inservice Inspection (RI-ISI) Program. NRC approved the BFN Unit 2 RI-ISI Program by letter dated January 19, 2001. TVA assumed that Table 4.1-1 of the WCAP had replaced the Code requirement as approved by NRC. Thus, the reference in the relief request to the WCAP Table 4.1-1, rather than the ASME Section XI Code requirement, was made.

NRC Question

For RR 2-ISI-18, the coverage of welds KR-2-25 (pipe to tee) and RWCU-2-003-G003 (pipe to flued head) is less than the required 100 percent volumetric examination coverage. Please address the following:

TVA stated that 50 and 75 percent coverage, respectively, for the above welds under the current ASME Section XI requirements are the maximum achievable coverage; however, another statement was made that 100 percent coverage under the requirements of the original ASME Section XI was achieved. Discuss the reason for the difference in coverage when the weld configuration is the same. Please provide a drawing of the weld configuration, showing the location of the obstructions. Also, provide a listing of ultrasonic (UT) examination reports, with transducer angles, coverage per scan direction, flaws and flaw location (if any). The information requested may be similar, but not limited to, the information provided for RR 2-ISI-19.

TVA response

TVA addresses this question on page 2, paragraph 1 of cover letter, and page E1-4 under "Basis of Relief" paragraphs 1 and 2 For 2-ISI-18.

In summary, previous exams were conducted using the prescriptive requirements of ASME Section XI, Appendix III. Though the scan paths and angles are equivalent, the current coverage requirements are based on utilizing a procedure qualified to ASME Section XI, Appendix VIII. The PDI Program is in agreement with the Final Rule regarding single side access for piping. The Final Rule requires that if access is available, the weld shall be scanned in each of the four directions (parallel and perpendicular to the weld on each side of the weld centerline) where required. Coverage credit may be taken for single side exams on ferritic piping. However, for austenitic piping, a procedure must be qualified with flaws on the inaccessible side of the weld. The Final Rule requires that single-side access examinations must demonstrate "equivalency to two-sided examinations." Current technology is not capable of reliably detecting or sizing flaws on the inaccessible side of an austenitic weld, for configurations common to U.S. nuclear applications.

As shown on the attached weld profile sheets, weld KR-2-25 coverage equals 50 percent because the joint configuration contains a non-parallel surface on the downstream side of weld centerline that limited scanning in the circumferential directions. This limitation does not exist in Weld RWCU-2-003-G003 and 75 percent coverage was achieved.

Ultrasonic examination reports for weld KR-2-25:

- Report R-066, dated 2/26/03:
 - o Transducer angles: 45 degree shear, 60 degree RL
 - o Scan direction coverage:
 - Down stream side - 100 percent
 - Upstream side - 0 percent
 - Clockwise - 50 percent
 - Counterclockwise - 50 percent
 - o Flaws: None
- Report R-0246, dated 10/16/94
 - o Transducer angles: 45 degree shear, 60 degree RL
 - o Scan direction coverage: 100 percent on all scans
 - o Flaws: None

Ultrasonic examination reports for weld RWCU-2-003-G003:

- Report R-124, dated 3/5/03:
 - o Transducer angles: 45 degree shear, 70 degree shear
 - o Scan direction coverage:
 - Down stream side - 100 percent
 - Upstream side - 0 percent
 - Clockwise - 100 percent
 - Counterclockwise - 100 percent
 - o Flaws: None
- Report R-0284, dated 4/2/93
 - o Transducer angles: 45 degree shear, 60 degree RL
 - o Scan direction coverage: 100 percent on all scans
 - o Flaws: None

NRC Question

TVA stated that the performance of the UT examination of the subject areas, to the maximum extent practical, provides an acceptable level of quality and safety because the information and data obtained from the volume examined provides sufficient information to judge the overall integrity of the piping welds. The technical bases provided in the submittal did not clearly address why the reduced coverage is sufficient to assure the integrity of the welds. Please discuss why the information and

data obtained from the reduced coverage will ensure the integrity of the weld configuration for the remainder of the Third Inservice Inspection Interval.

TVA Response

The weld examination coverage was not reduced from previous examinations, however, the credit allowable for "one-sided" ultrasonic weld examinations of austenitic stainless steel was reduced by the 10 CFR 50.55a(b)(2)(xv)(A)(2) rule change. This point was stated on page E1-5, "Justification," second paragraph, of 2-ISI-18.

In summary, the welds were examined using the best available techniques, equipment and personnel as qualified through the Performance Demonstration Initiative for Supplement 2 with demonstrated best effort for single-side examination. Instead of a full single-side qualification, PDI offers a best effort approach, which demonstrates that the best available technology is applied. This best effort approach does not meet the requirements of the Final Rule. PDI Performance Demonstration Qualification Summary (PDQS) austenitic piping certificates list the limitation that single side examination is performed on a best effort basis. This requires the inaccessible side of the weld to be listed as an area of no coverage. This examination provides, to the maximum extent practical, an acceptable level of quality and safety based upon the demonstrated and qualified techniques offered.

Based on the technical justification provided in the original submittal and the enclosed supplemental information, TVA believes that significant degradation, if present, would be detected during an ultrasonic examination, to the maximum extent practical, from one side of the weld. Therefore, pursuant to 10 CFR 50.55a(g)(5)(iii), TVA requests that relief be granted for the BFN Unit 2, Third Ten-Year Inspection Interval.

Attachment

Weld joint profiles for welds:

- RWCU-2-003-G003
- KR-2-25

ATTACHMENT

TVA	WALL THICKNESS PROFILE SHEET	00313 REPORT NO: <u>R.124</u>																													
PROJECT: <u>BEN</u> UNIT: <u>2</u>		WELD NO: <u>RWCU-2-003-G003</u> SYSTEM: <u>RWCU</u>																													
Record Thickness Measurements As Indicated, Including Weld Width, Edge-To-Edge At 0°																															
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <th>Position</th> <th>0°</th> <th>90°</th> <th>180°</th> <th>270°</th> </tr> <tr> <td>1</td> <td>N/A</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>.42</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>.46</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>.47</td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>.46</td> <td></td> <td></td> <td></td> </tr> </table>			Position	0°	90°	180°	270°	1	N/A				2	.42				3	.46				4	.47				5	.46		
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1	N/A																														
2	.42																														
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5	.46																														
CROWN HEIGHT: <u>FLUSH</u> DIAMETER: <u>6"</u> CROWN WIDTH: <u>.70</u> WELD LENGTH: <u>20.8"</u>																															
<p>COVERGE PLOT 45°/S AND 70°/S</p> <p>75% TOTAL REQUIRED EXAM COVERAGE</p> <p>THICKNESS AND PROFILE TAKEN FROM PREVIOUS DATA.</p>																															
EXAMINER: <u>[Signature]</u> LEVEL: <u>II</u> DATE: <u>3-5-03</u>		REVIEWED BY: <u>[Signature]</u> LEVEL: <u>III</u> DATE: <u>3-5-03</u> APPROVED: <u>B.G. Rice</u> DATE: <u>3-21-03</u> PAGE <u>5</u> OF <u>5</u>																													

TVA 1966B (R7-5-89)

1-106-999-

Weld RWCU-2-003-G003

TVA	WALL THICKNESS PROFILE SHEET	00150 REPORT NO: R.066																													
PROJECT: <u>BFNP</u> UNIT: <u>2</u>		WELD NO: <u>KR-2-25</u> SYSTEM: <u>Recirc.</u>																													
Record Thickness Measurements As Indicated, Including Weld Width, Edge-To-Edge At 0°																															
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<p style="text-align: center;">Contours Taken From Previous Data</p>																															
EXAMINER: <u>M. K. H.</u> LEVEL: <u>II</u> DATE: <u>2-26-03</u>		REVIEWED BY: <u>[Signature]</u> LEVEL: <u>III</u> DATE: <u>2-27-03</u> ANN: <u>B.S. P. 3/19/03</u> DATE: _____ PAGE: <u>5 of 5</u>																													

TVA 19648 (NP-5-87)

1-100-999-4

Weld KR-2-25