May 20, 2008

Mr. William R. Campbell, Jr.
Chief Nuclear Officer and
Executive Vice President
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: BROWNS FERRY NUCLEAR PLANT UNIT 3 - SAFETY EVALUATION FOR RELIEF REQUEST 3-ISI-22 LIMITED EXAMINATION COVERAGE FOR VALVE TO PIPE WELD GR-3-63 (TAC NO. MD6748)

Dear Mr. Campbell:

By a letter dated August 24, 2007, the Tennessee Valley Authority submitted Relief Request (RR) 3-ISI-22 requesting relief from the weld examination coverage requirements specified in the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI, 2001 Edition, as amended by Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.55a(b)(2)(xv)(A)(2), for valve to pipe weld GR-3-63 due to access limitations caused by design. In accordance with 10 CFR 50.55a(g)(5)(iii), your request proposed an ultrasonic examination of accessible areas to the maximum extent practical given the component design configuration of valve to pipe weld GR-3-63.

Based on our review of your submittal, we have concluded that granting relief for RR 3-ISI-22, pursuant to 10 CFR 50.55a(g)(6)(i), is authorized by law, will not endanger life, property, or the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

This relief is authorized for the remainder of the Third 10-year Inservice Inspection interval at Browns Ferry Nuclear Plant, Unit 3, which began November 19, 2005, and ends November 18, 2015. The enclosure documents our evaluation.

Sincerely,

/RA/

Thomas H. Boyce, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-296

Enclosure: Safety Evaluation

cc w/encl: See next page

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Tennessee Valley Authority

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

INSERVICE INSPECTION PROGRAM

RELIEF REQUEST NO. 3-ISI-22

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT, UNIT 3

DOCKET NO. 50-296

1.0 INTRODUCTION

By a letter dated August 24, 2007, the Tennessee Valley Authority (the licensee) submitted Relief Request (RR) 3-ISI-22 requesting relief from the weld examination coverage requirements specified in American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, 2001 Edition, as amended by Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.55a (b)(2)(xv)(A)(2), for valve to pipe weld GR-3-63 due to access limitations caused by design. In accordance with 10 CFR 50.55a(g)(5)(iii) your request proposed an ultrasonic examination of accessible areas to the maximum extent practical given the component design configuration of valve to pipe weld GR-3-63. The subject relief is for the remainder of the Third 10-year inservice inspection (ISI) interval at Browns Ferry Unit 3, which began November 19, 2005, and ends November 18, 2015.

2.0 REGULATORY REQUIREMENTS

The ISI of the ASME Code Class 1, Class 2, and Class 3 components is to be performed in accordance with Section XI of the ASME Code and applicable edition and addenda as required by Title 10 CFR 50.55a(g), except where specific relief has been granted by the Nuclear Regulatory Commission (NRC) pursuant to 10 CFR 50.55a(g)(6)(i). Section 50.55a(a)(3) to 10 CFR states, in part, that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if the applicant demonstrates that: (i) the proposed alternatives would provide an acceptable level of quality and safety, or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) will meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, *Rules for Inservice Inspection of Nuclear Power Plant Components*, to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein.

By letter dated August 24, 2007, the licensee, requested relief (3-ISI-22) from the volumetric examination coverage requirements for the reactor water recirculation full penetration valve to pipe weld GR-3-63. The ISI Code of record for Browns Ferry Unit 3 for the third 10-year ISI interval is the 2001 Edition of the Code, no Addenda.

3.0 RELIEF REQUEST NO. 3-ISI-22

3.1 Component Description

Recirculation System, Weld GR-3-63, Valve to Pipe (28-inch nominal pipe size, Austenitic Stainless Steel).

3.2 Code Requirements for Which Relief is Requested

ASME Code Case N-577, Table 1, Examination Category R-A, Item No. R1.16, requires essentially 100-percent volumetric examination of the weld and base material once during the 10-year interval. In addition to the Code requirement, 10 CFR 50.55a(b)(2)(xv)(A)(2) has amended the Code requirement to require that, where examination from both sides of an austenitic weld is not possible, full coverage credit from a single side may be claimed only after completing a successful single-sided Appendix VIII demonstration using a flaw on the opposite side of the weld.

3.3 Licensee's Proposed Alternative

In lieu of the ASME Code required 100-percent coverage, the licensee proposed an ultrasonic examination of accessible areas to the maximum extent practical within the design configuration of the austenitic pipe-to-valve weld. The resultant examination coverage equates to 75-percent coverage of the total weld volume.

3.4 Licensee's Bases for Alternative

The licensee stated that the weld was examined with the latest ultrasonic techniques, procedures, equipment, and personnel qualified to the requirements of the Performance Demonstration Initiative (PDI) Program, in accordance with the requirements of the 2001 Edition of the ASME Code, as amended by 10 CFR 50.55a(b)(2)(xv)(A)(2), and 10 CFR 50.55a(b)(2)(xxiv) as mandated by 10 CFR 50.55a(g)(4) and 10 CFR 50.55a(g)(6)(ii)(C).

The ultrasonic examination was performed on the piping weld of the accessible areas to the maximum extent practical given the component configuration. Credit for the one-sided only ultrasonic examination provided 75-percent coverage because 10 CFR 50.55a(b)(2)(xv)(A)(2) requires that where examination from both sides is not possible on austenitic welds, full coverage credit from a single side may be claimed only after completing a successful single-sided Appendix VIII demonstration using a flaw on the opposite side of the weld. The licensee stated that currently there is no Appendix VIII Program for cast austenitic piping welds, therefore, only 75-percent coverage can be claimed.

The licensee stated the performance of the ultrasonic examination of the subject weld to the maximum extent practical provides an acceptable level of quality and safety because the information and data obtained from the volume examined is sufficient to judge the overall integrity of the piping weld. The examination limitation does not affect assessing the sizing of the previously recorded indication found by previous ultrasonic examinations. Based on the above

discussion, the licensee requests that relief be granted pursuant to 10 CFR 50.55a(g)(5)(iii) for the third 10-year ISI interval.

3.5 Evaluation

Code Case N-577, Table 1, Examination Category R-A, Item No. R1.16 requires volumetric examination of 100 percent of the weld and adjacent base material as depicted in Figure IWB-2500-8(c). The NRC staff reviewed the data submitted for the subject weld and noted that due to the geometry and materials present in valve-to-pipe weld GR-3-63, only a one-sided ultrasonic examination was feasible. The component on the upstream side of this weld is made of cast austenitic stainless steel (CASS). The licensee stated that there is currently no qualified Appendix VIII program to interrogate CASS material and the staff agrees. Since only one-sided examination was feasible and no qualified Appendix VIII examination procedures exist for CASS, only 75-percent coverage was obtained for weld GR-3-63. The one-sided examination that was performed provided coverage of the required volumes of the weld and base material on the downstream side of weld GR-3-63. The staff also noted that there was no change in the recordable indications in the areas where coverage was obtained for four successive outages. Based on the ultrasonic examination data provided by the licensee, the staff concludes that there is no apparent growth due to the environment and the subject indication is benign. In addition, no new indications were discovered during the most recent examination which indicates that there is no pattern of degradation in the area ultrasonically examined. Finally, the licensee examined the subject weld with PDI qualified personnel, equipment, and procedures to the maximum extent practical.

The NRC staff concludes from the information provided by the licensee that any pattern of degradation would have been identified with the coverage obtained, and is therefore, acceptable. Based on the above discussion, the staff considers it impractical to redesign the subject weld in order to obtain the ASME Code required volumetric examination coverage and the alternative provides reasonable assurance of the structural integrity of the weld.

4.0 CONCLUSION

The NRC staff concludes that requiring the licensee to perform a design modification to obtain 100-percent coverage would result in a significant burden and that the ultrasonic examinations performed provides adequate assurance of the continued structural integrity of reactor water recirculation full penetration valve to pipe weld GR-3-63. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) for the third ISI interval as requested under RR 3-ISI-22 for Unit 3. This grant of relief is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: Timothy Steingass

Date: May 20, 2008