January 18, 2007

Mr. Charles D. Naslund
Senior Vice President and Chief Nuclear Officer
Union Electric Company
Post Office Box 620
Fulton, MO 65251

SUBJECT: CALLAWAY PLANT, UNIT 1 - RELIEF REQUEST ISI-41 FOR THE SECOND 10-YEAR INSERVICE INSPECTION INTERVAL (TAC NO. MD3437)

Dear Mr. Naslund:

By letter dated October 25, 2006 (ULNRC-05183), the Union Electric Company (the licensee) requested relief from certain examination requirements of Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (i.e., the ASME Code) for the second 10-year inservice inspection (ISI) interval at the Callaway Plant (Callaway). Relief Requests (RRs) ISI-34, ISI-35, ISI-36, ISI-37, ISI-38, ISI-39, ISI-40, and ISI-41 were submitted in that letter. This letter addresses RR ISI-41.

Based on the enclosed safety evaluation, the Nuclear Regulatory Commission staff has determined that the ASME Code-required examination coverage requirements are impractical for the subject welds listed in RR ISI-41, and, based on the coverages obtained, if significant service-induced degradation were occurring, there is reasonable assurance that evidence of it would be detected by the examinations that were performed. Therefore, granting relief, pursuant to paragraph 50.55a(g)(6)(i) of Title 10 of the *Code of Federal Regulations*, 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. The NRC staff grants the relief in RR ISI-41 for the second 10-year ISI interval at Callaway. All other ASME Code, Section XI, requirements for which relief was not specifically requested and approved remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Sincerely,

/RA/

David Terao, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-483

Enclosure: Safety Evaluation

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SECOND 10-YEAR INTERVAL INSERVICE INSPECTION

REQUEST FOR RELIEF NO. ISI-41

UNION ELECTRIC COMPANY

CALLAWAY PLANT, UNIT 1

DOCKET NO. 50-483

1.0 INTRODUCTION

By application dated October 25, 2006 (Agencywide Documents Access and Management System Accession No. ML063050203), Union Electric Company (the licensee) requested relief from certain examination requirements of Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (i.e., the ASME Code) for the second 10-year inservice inspection (ISI) interval at the Callaway Plant (Callaway). Relief Requests (RRs) ISI-34 through ISI-41 were submitted in the letter. This safety evaluation addresses RR ISI-41.

2.0 REGULATORY REQUIREMENTS

ISI of the ASME Code Class 1, 2, and 3 components is performed in accordance with Section XI of the ASME Code and applicable addenda as required by Title 10 of the *Code of Federal Regulations* (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). Paragraph 50.55a(a)(3) of 10 CFR states that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if: (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) shall meet the requirements, except the design and access provisions and the pre-service examination requirements, set forth in the ASME Code, Section XI, 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. The ASME Code of record for the Callaway second 10-year interval ISI program is the 1989 Edition of Section XI of the ASME Code.

3.0 NRC STAFF EVALUATION OF RR NO. ISI-41

3.1 Information provided by Licensee

The following information was provided by the licensee in the attachment to its application dated October 25, 2006, on RR ISI-41.

ASME Code Components

The component involved in the relief requests are the following:

- Pressurizer Spray Nozzle-to-Top Head weld 2-TBB03-10C-W
- Pressurizer Surge Nozzle-to-Lower Head weld 2-TBB03-10A-W

ASME Code Requirements

The applicable ASME Code requirements are the following: ASME Code, Section XI, IWB-2500-1, Category B-D, Item B3.110 requires volumetric examination of 100 percent of the weld as defined in ASME Code, Figure IWB-2500-7(b).

Licensee's Basis for Relief Request

In the attachment to its application for RR ISI-41, the licensee stated the following:

> The design configuration of the subject nozzle-to-head welds precludes ultrasonic examination of essentially 100% of the required examination volume. In order to examine the welds in accordance with the [ASME] code requirements, the pressurizer would require extensive design modifications. The physical arrangement of TBB03-10C-W, in conjunction with the close curvature of the outside wall surfaces of the nozzle does not allow for a complete examination from the nozzle side. Scans normal to the weld from the head side were essentially 100% complete.
>
> Similarly, the physical arrangement of 2-TBB03-10A-W, in conjunction with the close curvature of the outside wall surface of the nozzle does not allow for a complete examination from the nozzle side. For scans normal to the weld on the bottom vessel head side, examinations are limited to areas approximately 1.5" from the weld toe. Limitations on the bottom head side of 2-TBB03-10A-W are due to the presence of immersion heaters penetrating the head which restricts the scanning surface of the transducers.
>
> The weld configurations and the exact coverage achieved for each required scan

> are detailed in the attached ultrasonic examination reports[1].
>
> Performance of an ultrasonic volumetric examination 100% of full penetration welds in the pressurizer nozzle-to-head welds would be impractical. Ameren UE [Union Electric Company] has determined that it would be impractical to attempt other volumetric examination in order to increase examination coverage.

Licensee's Proposed Alternative Examination

In the attachment to its application for RR ISI-41, the licensee stated the following:

> In lieu of the [ASME] Code-required 100% ultrasonic examination, an ultrasonic examination was performed on accessible areas to the maximum extent practical. Ultrasonic examination of the subject welds to the maximum extent practical still provides assurance of an acceptable level of quality and safety. Significant degradation, if present, would have been detected during the ultrasonic examination that was performed on the subject welds.

3.2 NRC Staff's Evaluation

For the pressurizer spray nozzle-to-top head weld 2-TBB03-10C-W and pressurizer surge nozzle-to-lower head weld 2-TBB03-10A-W, the ASME Code, Section XI, requires volumetric examination of 100 percent of the subject welds. The licensee stated that the volumetric examination by ultrasonic methodology of this weld was conducted to the extent practical by the licensee using personnel, equipment, and procedures qualified in accordance with ASME Code, Section XI, Appendix VIII. The licensee found that during the ultrasonic examination of welds 2-TBB03-10C-W and 2-TBB03-10A-W, 100-percent coverage of the required examination volume could not be obtained. The licensee noted that the physical arrangement of welds 2-TBB03-10C-W and 2-TBB03-10A-W, in conjunction with the close curvature of the outside wall surfaces of the nozzles does not allow for a complete examination from the nozzle side of the subject nozzles. Therefore, based on the examination reports and descriptions of the subject nozzles provided in the licensee's letter dated October 25, 2006, the NRC staff determined that in order for the licensee to obtain essentially 100-percent coverage of the required examination volume for the pressurizer spray nozzle-to-top head weld 2-TBB03-10C-W, and pressurizer surge nozzle-to-lower head weld 2-TBB03-10A-W, the pressurizer would have to be redesigned which would cause a burden on the licensee. Based on this evaluation, the NRC staff concluded that it is impractical for the licensee to meet the applicable ASME Code requirements.

The licensee stated that it obtained a composite volumetric coverage of 82.7 and 54.8 percent for welds 2-TBB03-10C-W and 2-TBB03-10A-W, respectively. Based on these coverages, the NRC staff determined that the examinations performed would have detected any significant patterns of degradation, if present. The NRC staff also determined that the volumetric and ASME Code VT-2 visual examinations performed during system walk downs are of sufficient

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1. The licensee's examination reports for welds 2-TBB03-10C-W and 2-TBB03-10A-W are not included in this safety evaluation (SE) and can be found in the attachment to the licensee's letter dated October 25, 2006.

detail to provide reasonable assurance of the structural integrity of pressurizer spray nozzle-to-top head weld 2-TBB03-10C-W and pressurizer surge nozzle-to-lower head weld 2-TBB03-10A-W. Based on this finding and the impracticality of meeting the applicable ASME Code requirements, the NRC staff concludes that the requested relief may be granted to the licensee for the second 10-year interval in accordance with 10 CFR 50.55a(g)(6)(i).

4.0 CONCLUSION

The NRC staff has reviewed the licensee's submittal and concludes that ASME Code examination coverage requirements are impractical for welds 2-TBB03-10A-W and 2-TBB03-10C-W listed in RR ISI-41 for Callaway Plant. Furthermore, based on the coverages obtained, if significant service-induced degradation were present, there is reasonable assurance that evidence of it would be detected by the examinations that were performed. The NRC staff further concludes that the volumetric examinations performed, when combined with VT-2 visual examinations during plant walkdowns, provide reasonable assurance of structural integrity of the subject welds and no alternative requirements are deemed necessary. Therefore, the Commission grants the relief requested in RR ISI-41 pursuant to 10 CFR 50.55a(g)(6)(i) for Callaway for the second 10 year ISI interval.

The NRC staff has determined that granting relief pursuant to 10 CFR 50.55a(g)(6)(i) for RR ISI-41 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 remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: Thomas McLellan

Date: January 18, 2007

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