UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 12, 2015

Mr. Fadi Diya
Senior Vice President and
Chief Nuclear Officer
Union Electric Company
P.O. Box 620
Fulton, MO 65251

SUBJECT: CALLAWAY PLANT, UNIT 1 - REQUEST FOR RELIEF I4R-01, ALTERNATIVE TO ASME CODE INSERVICE INSPECTION REQUIREMENTS FOR CLASS 3 BURIED PIPING (TAC NO. MF4271)

Dear Mr. Diya:

By application dated June 10, 2014, as supplemented by letters dated September 30, 2014, and April 24, 2015, Union Electric Company (dba Ameren Missouri, the licensee), requested relief from the requirements of the American Society of Mechanical Engineers (ASME) *Boiler and Pressure Vessel Code* (Code), Section XI, associated with requirements for Class 3 buried piping systems at Callaway Plant, Unit 1 (Callaway Plant). The licensee requested relief for the remaining life of the Callaway Plant, including plant life extension that has been sought through October 18, 2044, beginning with the fourth 10-year inservice inspection (ISI) interval, which began on December 19, 2014. The ASME Code Edition applicable to the fourth 10-year ISI interval for Callaway Plant is the 2007 Edition (up to and including the 2008 Addenda). Subsequent to the licensee's application, on March 6, 2015, the NRC renewed the operating license for Callaway Plant for an additional 20 years, through October 18, 2044.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) paragraph 50.55a(a)(3)(i)), the licensee requested continued use of installed high density polyethylene piping on the basis that the alternative examination provides an acceptable level of quality and safety.

The paragraph headings in 10 CFR 50.55a were changed by *Federal Register* notice dated November 5, 2014 (79 FR 65776), which became effective on December 5, 2014 (e.g., 10 CFR 50.55a(a)(3)(i) is now 50.55a(z)(1), and 50.55a(a)(3)(ii) is now 50.55a(z)(2)). See the cross reference tables, which are cited in the notice, in the Agencywide Documents Access and Management System at Accession No. ML14015A191 and ADAMS package Accession No. ML14211A050.

Based on the enclosed safety evaluation, the NRC staff determines that the proposed alternative provides an acceptable level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(1). Therefore, the NRC staff authorizes the use of Relief Request I4R-01 at Callaway Plant for the remaining life of the Callaway Plant, including plant life extension through October 18, 2044, for the subject components.

All other ASME Code requirements for which relief was not specifically requested and approved remain applicable, including the third-party review by the Authorized Nuclear Inservice Inspector. If you have any questions, please contact Fred Lyon at 301-415-2296 or via e-mail at fred.lyon@nrc.gov.

Sincerely,

Robert Kuntz for

Michael T. Markley, Chief
Plant Licensing Branch IV-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-483

Enclosure:
Safety Evaluation

cc w/encl: Distribution via Listserv

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR RELIEF I4R-01 RELATED TO THE

INSERVICE INSPECTION PROGRAM FOR CLASS 3 BURIED PIPING

UNION ELECTRIC COMPANY

CALLAWAY PLANT, UNIT 1

DOCKET NO. 50-483

1.0 INTRODUCTION

By application dated June 10, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14161A399), as supplemented by letters dated September 30, 2014, and April 24, 2015 (ADAMS Accession Nos. ML14273A528 and ML15114A172, respectively), Union Electric Company (dba Ameren Missouri, the licensee), requested relief from the requirements of the American Society of Mechanical Engineers (ASME) *Boiler and Pressure Vessel Code* (Code), Section XI, associated with requirements for Class 3 buried piping systems at Callaway Plant, Unit 1 (Callaway Plant). The applicable ASME Code requirement is IWA-4221(b), which requires that, "An item to be used for repair/replacement activities shall meet the Construction Code specified in accordance with (1), (2), or (3)," and ASME Section XI, IWA-4221(b)(1), which requires that "when replacing an existing item, the new item shall meet the Construction Code to which the original item was constructed." The licensee requested relief for the remaining life of the Callaway Plant, including plant life extension that has been sought through October 18, 2044, beginning with the fourth 10-year inservice inspection (ISI) interval, which began on December 19, 2014. The ASME Code Edition applicable to the fourth 10-year ISI interval for Callaway Plant is the 2007 Edition (up to and including the 2008 Addenda). Subsequent to the licensee's application, on March 6, 2015, the NRC renewed the operating license for Callaway Plant for an additional 20 years, through October 18, 2044.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) paragraph 50.55a(a)(3)(i)), the licensee requested continued use of installed high density polyethylene (HDPE) piping on the basis that the alternative examination provides an acceptable level of quality and safety.

The paragraph headings in 10 CFR 50.55a were changed by *Federal Register* notice dated November 5, 2014 (79 FR 65776), which became effective on December 5, 2014 (e.g., 10 CFR 50.55a(a)(3)(i) is now 50.55a(z)(1), and 50.55a(a)(3)(ii) is now 50.55a(z)(2)). See the

cross-reference tables, which are cited in the notice, at ADAMS Accession No. ML14015A191 and ADAMS package Accession No. ML14211A050.

2.0 REGULATORY EVALUATION

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 in 10 CFR 50.55a(z) state that alternatives to the requirements of paragraph (g) of 10 CFR 50.55a may be used, when authorized by the NRC, if the licensee demonstrates (1) the proposed alternatives would provide an acceptable level of quality and safety or (2) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Based on the above, and subject to the following technical evaluation, the NRC staff finds that regulatory authority exists for the licensee to request and the Commission to authorize the proposed alternative requested by the licensee.

3.0 TECHNICAL EVALUATION

3.1 Proposed Request for Relief I4R-01

The ASME Code components affected by the licensee's request are as follows:

Essential Service Water (ESW) Supply Piping Lines:

- EF-003-AZC, A Train, 36-inch diameter, 411 feet
- EF-007-AZC, B Train, 36-inch diameter, 518 feet

ESW Return Piping Lines:

- EF-083-AZC, A Train, 36-inch diameter, 279 feet
- EF-014-AZC, B Train, 36-inch diameter, 288 feet

The Code of record for the fourth 10-year ISI interval is the ASME Code, Section XI, 2007 Edition through the 2008 Addenda. The fourth 10-year ISI interval began on December 19, 2014. Relief is requested for remaining life of the plant, including plant life extension that has been sought through October 18, 2044.

The applicable Code requirement is IWA-4221(b), which requires that, "An item to be used for repair/replacement activities shall meet the Construction Code specified in accordance with (1), (2), or (3)," and ASME Code, Section XI, IWA-4221(b)(1), which requires that, "when replacing an existing item, the new item shall meet the Construction Code to which the original item was constructed."

The Construction Code of record for buried ASME Class 3 ESW piping is ASME Code, Section III, Division 1 Subsection ND, 1974 Edition, through Summer 1975 Addenda. This Construction Code and later editions and addenda of this Construction Code do not provide rules for the design, fabrication, installation, examination, and testing of piping constructed using polyethylene material. By letter dated October 31, 2008 (ADAMS Accession No. ML082640007), as supplemented by letter dated November 7, 2008 (ADAMS Accession No. ML083100288), the NRC approved HDPE for use for the buried section of the ESW system in lieu of the carbon steel piping for Callaway Plant's third 10-year ISI interval.

As part of its proposed alternative and basis for use for I4R-01, the licensee stated in its letter dated September 24, 2015, that,

> In regard to continued use of the HDPE piping at Callaway, and to address the regulator's position that periodic testing would serve as a means to ensure integrity of the piping throughout the remainder of plant life, (as acknowledged in Ameren Missouri's letter ULNRC-06146, "Supplement to 10 CFR 50.55a Request: Proposed Alternative to ASME Section XI Requirements for Class 3 Buried Piping," dated September 30, 2014), 10-year periodic hydrostatic pressure testing of the HDPE piping will be performed prior to the end of the second period of the fourth 10-year ISI interval, and then once during each of the subsequent 10-year ISI intervals for the remainder of life of Callaway Plant.

3.2 NRC Staff Evaluation

The use of HDPE was approved at Callaway Plant for the third 10-year ISI interval on October 31, 2008, as supplemented by letter dated November 7, 2008. At that time, HDPE was not in use in nuclear power facilities in the United States, which warranted a 10-year limit to the NRC staff's approval. With further research and inservice history, there is compelling evidence that the continued use of HDPE will provide an acceptable level of quality and safety for the remainder of plant life, provided that periodic testing is performed. Periodic hydrostatic testing will insure that if any slow crack growth or failures in the piping have occurred, the licensee will have the ability to perform repair/replacement activities before causing any adverse effects during operation of the ESW piping system.

4.0 CONCLUSION

As set forth above, the NRC staff determines that the proposed alternative provides an acceptable level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(1). Therefore, the NRC staff authorizes the continued use of HDPE for the remaining life of the Callaway Plant, including plant life extension through October 18, 2044.

All other ASME Code, Section XI, requirements for which relief was not specifically requested and authorized remain applicable, including the third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: M. Audrain, NRR/DE/EPNB

Date: May 12, 2015

All other ASME Code requirements for which relief was not specifically requested and approved remain applicable, including the third-party review by the Authorized Nuclear Inservice Inspector. If you have any questions, please contact Fred Lyon at 301-415-2296 or via e-mail at fred.lyon@nrc.gov.

Sincerely,

/RA Balwant Singal for/

Michael T. Markley, Chief
Plant Licensing Branch IV-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-483

Enclosure:
Safety Evaluation

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