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

February 19, 2014

Mr. Eric A. Larson, Site Vice President
FirstEnergy Nuclear Operating Company
Beaver Valley Power Station
Mail Stop A-BV-SEB1
P.O. Box 4, Route 168
Shippingport, PA 15077

SUBJECT: BEAVER VALLEY POWER STATION, UNIT NO. 1 - RELIEF REQUEST NO. BV1-IWE-2-3 REGARDING VISUAL EXAMINATION OF THE CONTAINMENT LINER (TAC NO. MF2882)

Dear Mr. Harden:

By letter dated October 7, 2013,[1] FirstEnergy Nuclear Operating Company (the licensee) submitted request BV1-IWE-2-3 to the Nuclear Regulatory Commission (NRC). The licensee requested to use alternative requirements to the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, "Rules for Inservice Inspection (ISI) of Nuclear Power Plant Components," for Beaver Valley Power Station, Unit 1 (BVPS-1). As an alternative to the detailed visual examination required during a pressure test for a containment liner pressure boundary weld, the licensee proposed a visual examination of the liner repair weld prior to and after the required pressure test.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(a)(3)(i), the licensee requested to use the alternative to the ASME Code, Section XI noted above on the basis that the alternative provides an acceptable level of quality and safety. This request applies to the fourth 10-year ISI interval.

On October 9, 2013,[2] the NRC staff verbally granted authorization to the licensee for the proposed alternative.

The NRC staff has reviewed the licensee's relief request and has determined that the requested alternative will provide an acceptable level of quality and safety, as documented in the enclosed safety evaluation. Therefore, the licensee's request for the use of the above stated alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the BVPS-1, fourth 10-year ISI interval.

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.

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[1] Agencywide Documents Access and Management System Accession No. ML13281A477.
[2] ADAMS Accession No. ML13282A697.

If you have any questions, please contact the Beaver Valley Project Manager, Jeffrey A. Whited, at (301) 415-4090 or jeffrey.whited@nrc.gov.

Sincerely,

Meena Khanna, Chief
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-334

Enclosure:
Safety Evaluation

cc w/encl: Distribution via Listserv

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST NO. BV1-IWE-2-3 REGARDING IWE-5240 VISUAL EXAMINATION OF THE CONTAINMENT LINER

FIRSTENERGY NUCLEAR OPERATING COMPANY

BEAVER VALLEY POWER STATION, UNIT NO. 1

DOCKET NO. 50-334

1.0 INTRODUCTION

By letter dated October 7, 2013,[1] FirstEnergy Nuclear Operating Company (FENOC, the licensee) submitted request BV1-IWE-2-3 to the Nuclear Regulatory Commission (NRC). The licensee requested to use alternative requirements to the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, "Rules for Inservice Inspection (ISI) of Nuclear Power Plant Components," for Beaver Valley Power Station, Unit 1 (BVPS-1). As an alternative to the detailed visual examination required during a pressure test for a containment liner pressure boundary weld, the licensee proposed a visual examination (VT-1) of the liner repair weld prior to and after the required pressure test.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(a)(3)(i), the licensee requested to use the alternative to the ASME Code, Section XI noted above on the basis that the alternative provides an acceptable level of quality and safety.

On October 9, 2013,[2] the NRC staff verbally granted authorization to the licensee for the proposed alternative.

REGULATORY EVALUATION

The regulations in 10 CFR 50.55a(g)(4) requires that ISI of the pressure retaining components of the steel (Class MC) and concrete (Class CC) containments meet the requirements set forth in Section XI of the ASME Code and Addenda that are incorporated by reference in 10 CFR 50.55a(b), subject to the condition listed in Paragraph (b)(2)(vi), and the conditions listed in paragraphs (b)(2)(viii) and (b)(2)(ix). Exceptions are allowed to these requirements when alternatives have been authorized pursuant to 10 CFR 50 55a(a)(3)(i) or (a)(3)(ii).

In proposing alternatives, a licensee must demonstrate that the proposed alternatives provide an acceptable level of quality and safety (10 CFR 50.55a(a)(3)(i)) or that compliance would

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[2] ADAMS Accession No. ML13282A697

Enclosure

result in hardship or unusual difficulty without a compensating increase in the level of quality and safety (10 CFR 50.55a(a)(3)(ii)). Section 50.55a allows the NRC to authorize alternatives to ASME Code requirements upon making necessary findings.

BVPS-1 is currently in the fourth 10-year ISI interval which began April 1, 2008, and ends March 31, 2018. The applicable ASME Section XI Code of record for the current ISI interval is the 2001 Edition of the ASME Code Section XI through the 2003 Addenda. This alternative is proposed to support repair activities during the current outage and for the remainder of the fourth interval.

3.0 TECHNICAL EVALUATION

3.1 Licensee's Alternative Request (BV1-IWE-2-3)

The affected component for this request is the BVPS-1 containment liner. The containment liner is not an ASME Code pressure vessel; however, the containment liner is a Class CC component subject to ASME Code, Section XI, Subarticle IWE requirements.

Subarticle IWE-5221, "System Pressure Tests: Tests Following Repair/Replacement Activities: Leakage Test," requires, in part, that, "repair/replacement activities performed on the pressure retaining boundary of Class MC or Class CC components shall be subjected to a pneumatic leakage test in accordance with the provisions of Title 10, Part 50 of the *Code of Federal Regulations*, Appendix J, Paragraph IV.A."

Subarticle IWE-5240, "System Pressure Tests: Tests Following Repair/Replacement Activities: Visual Examination," requires, in part, that, "during the pressure test required by IWE-522[1], a detailed visual examination shall be performed on areas affected by repair/replacement activities."

Page 1 of the enclosure to letter dated October 9, 2013, states, in part, that:

> During the fall 2013 maintenance and refueling outage for BVPS-1, a coatings examination of the painted internal surface of the containment liner plate identified a surface defect. Subsequent surface cleaning revealed the surface defect as a through-wall hole in the containment liner plate. The area of the through-wall hole was approximately 0.42 inches by 0.29 inches. Repairs include removing the degraded portion of the liner plate and welding a replacement plate in place. . .

Following the repairs, a pneumatic leakage test is required in accordance with IWE-5221. The licensee plans to perform a local leak rate test on the repaired area; however, the test requires the use of a rig which will make the internal areas affected by the repair activities inaccessible for direct visual inspection during the local leak rate test. The outside surface of the repair is covered with concrete and is therefore inaccessible. Relief is requested from the direct visual examination requirement specified in Subarticle IWE-5240 during the leakage test required by Subarticle IWE-5221.

The licensee proposes to perform a VT-1 visual examination of the affected area, both prior to and following the local leak rate test. Page 2 of the enclosure to letter dated October 9, 2013, states, in part, that:

> Visual examination (VT-1) prior to the performance of the local leak rate testing provides assurance that the affected area has been properly prepared for testing and no abnormalities exist in the affected area. The local leak rate test will provide an accurate and direct method of assuring the leak-tight integrity of the repair welds. Post leak rate test visual examination (VT-1) provides assurance that the tested area is free of abnormalities that may be exposed by the local leak rate test.

3.2 NRC Staff Evaluation

The licensee requested authorization of an alternative, VT-1 examination prior to and after the pressure test, instead of the detailed visual examination required during the pressure test, per ASME Code, Section XI, Subarticle IWE-5240. The NRC staff noted that the test rig employed to perform the local leak rate pressure test will cover the repaired areas of the containment liner, making the liner inaccessible during the leak test. To address this, the licensee will conduct a VT-1 visual examination of the repair prior to the local leak test and after completion of the leak test. The VT-1 examination meets all of the requirements of the visual examination required by Subarticle IWE-5240 of the ASME Code, Section XI. The visual examinations provide assurance that the repaired area is free of abnormalities before and after the leak test, while the leak test itself assures the integrity of the repair weld.

In addition, the inability to conduct a visual inspection during the pressure test has been addressed by the ASME Code, Section XI, Code Case N-649, "Alternative Requirements for IWE-5240 Visual Examination," which allows the required post-repair visual examination to be performed during or after the pressure test. The NRC staff has previously identified ASME Code Case N-649 as acceptable for use, with no conditions or limitations, as stated in NRC Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," Revision 16. Code Case N-649 is applicable through the 1998 Edition of the ASME Code. The requirements in Subarticle IWE-5240 are identical in the 1998 Edition and the 2001 Edition of the ASME Code, Section XI. Furthermore, in the 2004 Edition of the ASME Code, Section XI, this visual inspection requirement has been revised to allow the inspection to occur during or after the post-repair pressure test.

Since the VT-1 examination is as detailed as the code-required examination, and since conducting the examination after the pressure test has previously been found acceptable, the NRC staff finds that implementation of the proposed alternative for the remainder of the current BVPS-1 ISI interval is acceptable.

4.0 CONCLUSION

As set forth above, the NRC staff determined that the proposed alternative, BV1-IWE-2-3, 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(a)(3)(i) and is in compliance with the ASME Code, Section XI requirements. 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.

Therefore, the NRC staff authorizes the proposed alternative, BV1-IWE-2-3, at BVPS-1 for the purpose of meeting post-repair visual inspections requirements for the steel containment liner. The proposed alternative is authorized for use during the fourth 10-year ISI interval, which is scheduled to end March 31, 2018.

Principal Contributor: B. Lehman

Date: February 19, 2014

If you have any questions, please contact the Beaver Valley Project Manager, Jeffrey A. Whited, at (301) 415-4090 or jeffrey.whited@nrc.gov.

Sincerely,

/ra/

Meena Khanna, Chief
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-334

Enclosure:
Safety Evaluation

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