



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

June 22, 2023

**NINE MILE POINT NUCLEAR STATION, UNIT NO. 1– AUTHORIZATION AND SAFETY EVALUATION FOR ALTERNATIVE RELIEF REQUEST I5R-14 ASSOCIATED WITH N2E SAFE END-TO-NOZZLE DISSIMILAR METAL WELD REPAIR WITH LAMINAR INDICATION (EPID: L-2023-LLR-0017)**

**LICENSEE INFORMATION**

**Recipient's Name and Address:** Mr. David P. Rhoades  
Senior Vice President  
Constellation Energy Generation, LLC  
President and Chief Nuclear Officer  
Constellation Nuclear  
4300 Winfield Rd  
Warrenville, IL 60555

**Licensee:** Constellation Energy Generation, LLC (CEG)

**Plant Name and Unit:** Nine Mile Point Nuclear Station, Unit No. 1

**Docket No.:** 50-220

**APPLICATION INFORMATION**

**Application Date:** April 13, 2023

**Application Agencywide Documents Access and Management System (ADAMS) Accession No.:** ML23103A404

**Licensee Proposed Alternative No. or Identifier:** I5R-14

**Applicable Inservice Inspection (ISI) Program Interval and Interval Start/End Dates:** The fifth 10-year ISI interval for Nine Mile Point Nuclear Station, Unit No. 1 (Nine Mile Point, Unit 1), began on April 23, 2019, and is scheduled to end August 22, 2029.

**Alternative Provision:** The applicant requested an alternative under Title 10 of the *Code of Federal Regulations* (10 CFR), paragraph 50.55a(z)(1).

**ISI Requirement:** American Society of Mechanical Engineer (ASME) Boiler & Pressure Vessels Code (Code), Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," IWA-4411, IWA-4411(a), IWA-4411(b), IWA-4412, IWA-4611 and IWB-3640.

**Applicable Code Edition and Addenda:** The applicable code of record for the fifth 10-year ISI interval at Nine Mile Point, Unit 1, is ASME Code, Section XI, 2013 Edition.

**Verbal Authorization:**

On April 14, 2023 (ML23104A347), the U.S. Nuclear Regulatory Commission (NRC) verbally authorized the use of Relief Request I5R-14 at Nine Mile Point, Unit 1, on the basis that the proposed alternative provides an acceptable level of quality and safety, and the structural integrity and leak tightness of the subject overlaid weld will be maintained until the end of the next refueling outage (N1R28). This safety evaluation documents the technical basis for the NRC's verbal authorization.

**Background:**

On March 31, 2023 (ML23090A130), the NRC verbally authorized the use of Relief Request I5R-11 at Nine Mile Point, Unit 1, on the basis that the proposed alternative provides an acceptable level of quality and safety, and the structural integrity and leak tightness of the subject overlaid weld will be maintained until the end of the next refueling outage (N1R28).

Relief Request I5R-11 proposed a design weld overlay (WOL) on N2E safe end-to-nozzle dissimilar metal (DM) weld 32-WD-208. Relief Request I5R-11 is based on Code Cases N-740-2, N-638-10 and ASME Code Section XI, Appendix Q. The examination acceptance criteria for the WOL are based on the acceptance criteria in Code Case N-740-2. Upon examination of the completed weld overlay, the licensee discovered three weld indications, identified as laminar indications 1, 2, and 3. Indication (flaw) number 2 does not meet the acceptance criteria in Code Case N-740-2. The current proposed alternative, Relief Request I5R-14, seeks to use WOL acceptance criteria in Section XI, Non-Mandatory Appendix Q, in lieu of the acceptance criteria specified in Code Case N-740-2.

The applicable Code requirements for which the licensee seeks relief are the same for I5R-11 and I5R-14. The applicable Code requirements are ASME Code Section IX, IWA-4411, IWA-4411(a), IWA-4411(b), IWA-4412, IWA-4611, and IWB-3640.

**Brief Description of the Proposed Alternative:**

Pursuant to 10 CFR 50.55a(z)(1), CEG proposes an alternative to the ASME Code requirements as specified above to permit a laminar flaw (indication 2) to remain in place for the upcoming cycle at Nine Mile Point, Unit 1.

The laminar flaw acceptance criteria of Code Case N-740-2 (as verbally authorized by the NRC for Relief Request I5R-11, ML23090A130) will not be used for indication 2. In lieu of these requirements, the flaw acceptance criteria of ASME Section XI, Non-Mandatory Appendix Q, Section Q-4100 will be met.

This alternative is proposed for use until the end of the Nine Mile Point, Unit 1 refueling outage N1R28 in 2025 during which a full structural WOL repair will be performed on the N2E safe end-to-nozzle weld.

For additional details on the licensee's request, please refer to the documents located at the ADAMS Accession No(s) identified above.

## STAFF EVALUATION

As stated above, the licensee's NRC approved alternative to install a design WOL on N2E safe end-to-nozzle DM weld 32-WD-208 was verbally approved on March 31, 2023, and specifies that the acceptance criteria for the WOL will be the acceptance criteria listed in Code Case N-740-2. Code Case N-740-2 Section 3(a)(3)(a) specifies the acceptance standards of Section XI, IWB-3514, with the additional limitations that the total laminar flaw area shall not exceed 10 percent of the weld surface area and that no linear dimension of the laminar flaw area shall exceed the greater of 3 inches (76 mm) or 10 percent of the pipe circumference. Laminar flaw (indication 2) was measured at 0.3 inches wide and approximately 12.2 inches long. The pipe diameter is 91.3 inches resulting a flaw with a length representing 13.4 percent of the pipe diameter. Therefore, the WOL (flaw) indication 2 does not meet the second limitation in Code Case N-740-2, Section 3(a)(3)(a).

Appendix Q, Q-4000(c)(1) requires that laminar flaws meet the acceptance standards of Table IWB-3514-3, which allows a laminar flaw area of 7.5-in.<sup>2</sup> but does not have the limitation in N-740-2 that no linear dimension of a laminar flaw area shall exceed the greater of 3 inches (76 mm) or 10 percent of the pipe circumference. The staff notes that the area of laminar flaw 2 is 3.66-in.<sup>2</sup> and the total area of all laminar flaws (indications 1, 2 and 3) added together is 6.37 in.<sup>2</sup>

Figures showing the design WOL and the location laminar flaw number 2 and indications 1 and 3, in relation to the original axial flaw that was mitigated by the design WOL, can be found on page 4 of 6 in the licensee's submittal dated April 13, 2023. Laminar flaw (indication 2), the subject of the currently proposed alternative, is located at the interface of the stainless-steel safe end and the ER 309L buffer layer, which is applied to mitigate potential welding issue if Alloy 52M were to be placed directly on the stainless-steel safe end material.

Laminar flaw (indication 2) is 1.5 inches from the toe of the original weld and approximately 22.5 inches clockwise from the original axial flaw. This laminar flaw is embedded and is therefore not in contact with reactor coolant. Laminar flaw (indication 2) is located sufficiently far from the original flaw to not impact the ability to examine the required NDE volume including the susceptible material (Alloy 82/182) in DM weld 32-WD-208. The licensee performed a bounding analysis of the laminar flaw by assuming a 0.3-inch-wide laminar flaw 360 degrees around the pipe, taking into account internal pressure and a bending moment. The staff finds this conservative given that the assumed flaw is substantially larger than the actual flaw. The analysis shows an insignificant difference in the applied stress with and without the laminar flaw. Hence, the laminar flaw has no impact on the material performance of the weld overlay.

Therefore, the NRC staff finds the licensee's proposed alternative acceptable because the axial flaw is not near the laminar flaw, the licensee's analysis shows that the laminar flaw does not significantly increase applied stresses, and Appendix Q provides appropriate acceptance criteria for the subject laminar flaw for the one operating cycle duration requested under Relief Request I5R-14.

## CONCLUSION

The NRC staff has determined that the licensee's proposed alternative provides an acceptable level of quality and safety, and that the structural integrity and leak tightness of the subject overlaid weld will be maintained until the end of the next refueling outage (N1R28). The NRC concludes that the licensee has adequately addressed the regulatory requirements set forth in 10 CFR 50.55a(z)(1).

The NRC staff authorizes the use of proposed alternative, Relief Request I5R-14, at Nine Mile Point, Unit 1, until the next refueling outage (N1R28).

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

Principal Contributor: Robert Davis

Date: June 22, 2023

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Hipólito J. González, Chief  
Plant Licensing Branch I  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

cc: Listserv

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**ADAMS Accession No.: ML23156A683**

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