



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

July 23, 2025

**DIABLO CANYON NUCLEAR POWER PLANT, UNIT 2 – AUTHORIZATION AND SAFETY
EVALUATION FOR ALTERNATIVE REQUEST NO. NDE-RCS-SE-2R25
(EPID L-2025-LLR-0020)**

LICENSEE INFORMATION

Recipient's Name and Address: Ms. Paula Gerfen
Senior Vice President, Generation
and Chief Nuclear Officer
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Diablo Canyon Power Plant
P.O. Box 56, Mail Code 104/6
Avila Beach, CA 93424

Licensee: Pacific Gas and Electric Company (PG&E)

Plant Name and Units: Diablo Canyon Nuclear Power Plant (Diablo Canyon), Unit 2

Docket No.: 50-323

APPLICATION INFORMATION

Submittal Date: February 12, 2025

Submittal Agencywide Documents Access and Management System (ADAMS) Accession No.: ML25043A071

Applicable Inservice Inspection (ISI) Program Interval and Interval Start/End Dates: Fourth ISI interval, which commenced on March 13, 2016, and is scheduled to end March 12, 2026.

Alternative Provision: The licensee requested an alternative under Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(z)(1), "Acceptable level of quality and safety."

ISI Requirement: The licensee is required to use American Society of Mechanical Engineers (ASME) Code Case N-770-7, "Alternative Examination Requirements and Acceptance Standards for Class 1 PWR [Pressurized-Water Reactor] Piping and Vessel Nozzle Butt Welds Fabricated With UNS N06082 or UNS W86182 Weld Filler Material With or Without Application of Listed Mitigation Activities, Section XI, Division 1," as modified by 10 CFR 50.55a, "Codes and standards," for the examination of dissimilar metal vessel nozzle butt welds containing Alloy 82/182 material.

The ultrasonic tests (UT) are required to be performed per ASME Boiler and Pressure Vessel Code (ASME Code), Section XI, appendix VIII, supplements 2 and 10, unless cast stainless steel (CASS) is part of the examination volume. The CASS side of the cold leg elbow-to-safe

end welds are required to meet ASME Code, Section XI, appendix III, as modified by ASME Code, Section XI, appendix I, supplement 1.

ASME Code, Section XI, appendix VIII requires procedures and personnel to pass performance demonstration testing with a 0.125-inch root mean square error (RMSE) for sizing the depths of flaws detected in the demonstration testing.

ASME Code Cases N-695-1, "Qualification Requirements for Dissimilar Metal Piping Welds, Section XI, Division 1," and N-696-1, "Qualification Requirements for Mandatory Appendix VIII Piping Examinations Conducted from the Inside Surface Section XI, Division 1," are conditionally approved for use in Regulatory Guide (RG) 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," Revision 21, dated March 2024 (ML23291A003). ASME Code Cases N-695-1 and N-696-1 revise the requirements for procedures and personnel to pass performance demonstration testing with a 0.250-inch depth sizing RMSE.

ASME Code Cases N-695-1 and N-696-1 are conditioned in RG 1.147 such that examiners qualified using the 0.250-inch RMSE for measuring the depths of flaws are not qualified to depth-size inner-diameter (ID) surface-breaking flaws greater than 50-percent through-wall in dissimilar metal welds 2.1 inches or greater in thickness. If an examiner measures a flaw as greater than 50-percent through-wall in a dissimilar metal weld from the ID, the flaw shall be considered to have an indeterminate depth.

The scope of ASME Code Cases N-695-1 and N-696-1 does not include ID examinations of welds with corrosion-resistant cladding (CRC).

Applicable Code Edition and Addenda: The Code of record is ASME Code, Section XI, 2007 Edition with the 2008 Addenda.

Brief Description of the Proposed Alternative: The licensee is proposing to use a vendor qualified for ID detection and length sizing per appendix VIII, as applicable to the welds similar in configuration and materials (i.e., without CRC) to the welds included in this request. Indications requiring depth sizing will use the 0.250-inch RMSE requirements of ASME Code Cases N-695-1 and N-696-1 for examinations of dissimilar metal and safe end-to-piping stainless steel welds with corrosion-resistant cladding. The list of dissimilar metal welds covered in the proposed alternative are given in the letter dated February 12, 2025 (ML25043A071).

The examination vendor contracted to perform the safe end examinations has demonstrated the ability to depth size indications in dissimilar metal welds with a RMSE of 0.189 inch instead of the 0.125-inch RMSE required by ASME Code, Section XI, appendix VIII, supplement 10. Additionally, the vendor has demonstrated the ability to depth size with a 0.245-inch RMSE when applying combined aspects of appendix VIII, supplements 2 and 10 per ASME CodeCase N-696-1. Both of these qualifications are within the prescribed RMSE of 0.250 inch established in Code Cases N-695-1 and N-696-1.

The licensee is making the following regulatory commitments in support of this request:

Commitment 1:

If a reportable indication is detected and determined to be ID surface connected during examination of the welds in accordance with this relief request, PG&E will

provide an evaluation for review, including the measured size as determined by UT examination. EC [eddy current] testing will be used to determine if the indication is surface connected. Additional data including details of the surrounding ID surface contour in the region of the indication and percentage of the exam area where UT probe lift-off is evident, if any, will be included.

Commitment 2:

In the event that any indication(s) requiring depth sizing are detected during examination of welds in accordance with this relief request, the following criteria shall be implemented:

- Indications detected and measured as less than 50 percent through-wall in depth shall be measured per Code Cases N-695-1 and N-696-1.
- Indications detected and measured as 50 percent through-wall depth or greater and to remain in service without mitigation or repair, will be classified as indeterminate depth as conditioned in RG 1.147, Revision 21 for Code Cases N-695-1 and N-696-1. PG&E shall submit evaluation(s) for review and approval prior to reactor startup. The evaluation shall include:
 - information concerning the mechanism that caused the indication
 - information concerning the inside surface roughness/profile of the surrounding region
 - information concerning areas where UT probe lift-off is observed

STAFF EVALUATION

The U.S. Nuclear Regulatory Commission (NRC) staff has evaluated proposed alternative request NDE-RCS-SE-2R25 pursuant to 10 CFR 50.55a(z)(1) to determine if the proposed alternative provides an acceptable level of quality and safety. As described above, the licensee is proposing an alternative to the requirements of the ASME Code, Section XI, appendix VIII, supplements 2 and 10, as modified by ASME Code Case N-695-1 and Code Case N-696-1. These Code Cases require that procedures used to inspect welds from the ID be qualified by performance demonstration.

The acceptance criterion for depth-sizing of flaws established by ASME Code, Section XI, appendix VIII is an RMSE of not greater than 0.125 inch. To date, examination vendors have qualified for detection and length sizing in accordance with the requirements for examinations from the ID, but the vendors have not met the ASME Code, Section XI, Appendix VIII requirement of an RMSE of 0.125 inch for indication depth sizing.

ASME Code Cases N-695-1 and N-696-1 were created to resolve this issue by establishing 0.250-inch RMSE as the required standard for depth measurement. ASME Code Cases N-695-1 and N-696-1 are conditionally accepted for use in RG 1.147. The licensee is proposing to use the requirements in Code Case N-695-1 to satisfy the requirements of ASME Code, Section XI, appendix VIII, supplement 10 and Code Case N-696-1 to satisfy the requirements of ASME Code, Section XI, appendix VIII, supplement 2. The licensee is able to meet the 0.250-inch RMSE standard for depth measurement.

The use of ASME Code Cases N-695-1 and N-696-1 does not apply to examinations of welds from the ID if the welds have corrosion-resistant cladding. This exclusion is the result of the small number of plants with corrosion-resistant cladding and the difficulties associated with developing test blocks for this subset of reactors. To demonstrate that the proposed inspections can be effective through the corrosion-resistant cladding, the licensee provided a technical justification (WDI-TJ-1044 Revision 1, "Demonstration Report/Technical Basis Document: Ultrasonic Examination of Diablo Canyon Unit 2 Reactor Pressure Vessel Nozzle to Safe End Welds for the ID Surface Through a Welded Protective Layer," (ML102350297)) to document the process and results of the additional demonstration activities. This technical justification effectively shows that the inspection vendor can effectively examine welds through the corrosion-resistant cladding.

The licensee has proposed two regulatory commitments to address the ASME Code Cases N-695-1 and N-696-1 conditions. The proposed commitments, along with standard industry practices, provide reasonable assurance that any possible deep flaws in the subject welds would be appropriately handled by the licensee.

CONCLUSION

The NRC staff has determined that the proposed alternative in the licensee's request referenced above would provide an acceptable level of quality and safety.

The NRC staff 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 NDE-RCS-SE-2R25 at Diablo Canyon Nuclear Power Plant, Unit 2, for the remainder of fourth ISI interval which commenced on March 13, 2016, and is scheduled to end March 12, 2026.

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

Principal Contributor: Stephen Cumblidge, NRR

Date: July 23, 2025

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cc: Listserv

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(EPID L-2025-LLR-0020) DATED JULY 23, 2025

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