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Sent: Friday, October 27, 2023 1:33 PM
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Cc: Jennifer Dixon-Herrity; Matthew Mitchell; Angie Buford; John Tsao; Eric Reichelt; Steven Levitus; John Dixon; Lindsay Merker (She/Her); Noe Cuevas; Eric Lantz; Katherine.Gil@aps.com; Boris.Bolf@aps.com
Subject: Palo Verde Unit 1 - Verbal Authorization of Relief Request 70, Proposed Alternatives for Pressurizer Lower Shell Temperature Nozzle (EPID L-2023-LLR-0057)

Please note the following official verbal authorization of the subject relief request we provided to you during the conference call held at 1:00 PM (ET) this afternoon:

VERBAL AUTHORIZATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELIEF REQUEST 70
ALTERNATIVE TO ASME CODE REQUIREMENT
FOR A PRESSURIZER THERMOWELL NOZZLE REPAIR
PALO VERDE NUCLEAR GENERATING STATION, UNIT 1
ARIZONA PUBLIC SERVICE COMPANY
DOCKET NO. STN 50-528
OCTOBER 27, 2023

Technical Evaluation read by Angie Buford, Chief of the Vessels and Internals Branch, Office of Nuclear Reactor Regulation

By letter dated October 23, 2023, (Agencywide Documents Access and Management Systems Accession No. ML23296A254), as supplemented by letter dated October 26, 2023, (ML23299A305), Arizona Public Service Company (the licensee), requested an alternative to the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, 2013 edition, and Code Case N-638-10, "Similar and Dissimilar Metal Welding Using Ambient Temperature Machine Gas Tungsten Arc Welding (GTAW) Temper Bead Technique, Section XI, Division 1," for Palo Verde Nuclear Generating Station (Palo Verde), Unit 1. The licensee submitted Relief Request 70 for U.S. Nuclear Regulatory Commission (NRC) review and approval to support performing a weld repair of the pressurizer thermowell nozzle weld. Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(z)(1), the licensee submitted Relief Request 70 on the basis that it will provide for an acceptable level of quality and safety for the unit's next cycle of operation.

Palo Verde is in the second period of the fourth 10-year inservice inspection (ISI) interval. On October 9, 2023, while performing small nozzle inspections during Unit 1 refueling outage 1R24, the licensee identified boric acid leakage in the weld of the pressurizer lower shell thermowell nozzle. The weld material is identified as Alloy 82. The examination results constitute defects in the primary coolant system that are unacceptable under the ASME Code, Section XI.

The licensee is preparing to apply weld repairs to the pressurizer surface and nozzle J-groove weld. The licensee is proposing to remove the existing Alloy 82 weld pad on the outer diameter (OD) of the pressurizer shell and perform dye penetrant testing (PT). The licensee stated that a

new weld pad will be deposited on the OD of the pressurizer with Alloy 52M using the machine gas tungsten arc welding (GTAW) process. The licensee stated that the repair will be in accordance with ASME Code, Section XI and ASME Code Case N-638-10, with one exception to Code Case N-638-10. The licensee is proposing to perform the final examination using PT and ultrasonic examination testing (UT) without waiting the required 48-hours from the completion of the three tempering layers. Upon completion of the weld pad, the licensee will install a new Alloy 690 nozzle and perform a partial penetration J-groove weld of the Alloy 690 nozzle to the Alloy 52M weld pad. PT will be performed at half thickness and at full thickness after the weld is complete. The licensee stated that the PT will be in accordance with ASME Code Section III, NB-5245. The licensee is requesting relief for the duration of Cycle 25 for Unit 1 which concludes in the Spring of 2025.

The staff finds the licensee's proposal to perform the final examination using PT and UT without waiting for the 48-hour hold time to be acceptable. All required nondestructive examination per Code Case N-638-10 will be performed by qualified examiners and a procedure qualified in accordance with the ASME Code, Section XI. The Alloy 52M weld material is being applied with the machine GTAW process which produces welds with very low diffusible hydrogen when compared to welding processes that use flux. Therefore, hydrogen induced cracking is not likely to occur, and performing the final PT and UT prior to the 48-hour hold time provides for an acceptable level of quality and safety. In addition, the NRC staff is unaware of any instances of hydrogen induced cracking out of the numerous weld overlays that have been completed by the nuclear industry using any of the revisions of Code Case N-638.

As part of the technical basis, the licensee addressed flaw evaluation of the as-left J-groove weld, design analysis of the nozzle repair, corrosion evaluation of the pressurizer lower shell, and loose parts evaluation in its submittal. The licensee stated that the evaluations are bounding for the one cycle of operation. The licensee will provide these analyses 14 days after the end of refueling outage 1R24. Because the licensee's analyses satisfy various respective acceptance criteria such as the ASME Code, Sections III and XI, as well as flaw evaluation and flaw removal requirements, the staff determined that based on the licensee's submittal that the proposed repair is acceptable for the one fuel cycle of operation.

Based on the above evaluation, the NRC staff finds that the licensee's proposed Relief Request 70 will provide an acceptable level of quality and safety in accordance with 10 CFR 50.55a(z)(1).

Authorization read by Jennifer Dixon-Herrity, Chief of Plant Licensing Branch 4, Division of Operating Reactor Licensing, NRR

As chief of the Plant Licensing Branch 4, Office of Nuclear Reactor Regulation, I concur with the conclusions of the Piping and Head Penetration and Vessels and Internals Branches.

As set forth above, the NRC 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 regulatory requirements set forth in 10 CFR 50.55a(z)(1). Therefore, as of October 27, 2023, the NRC authorizes the use of Relief Request 70 at Palo Verde, Unit 1 during refueling outage 1R24 for the duration of Cycle 25, which concludes in the spring of 2025.

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

This verbal authorization does not preclude the NRC staff from asking additional clarification question(s) regarding the proposed alternative while preparing the subsequent written safety evaluation.

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