

From: William Orders

Sent: Friday, April 11, 2025 3:08 PM

To: Michael.Dilorenzo@aps.com

Cc: Tony Nakanishi <Tony.Nakanishi@nrc.gov>; Angie Buford <Angela.Buford@nrc.gov>

Subject: VERBAL AUTHORIZATION RELIEF REQUEST RR-73 (RESENDING TO ADD APS PARTICIPANTS)

Dear Mr. DiLorenzo,

By telephone conversation on April 10, 2025, the U.S. Nuclear Regulatory Commission (NRC) staff provided a verbal authorization to Arizona Public Service (the licensee) accepting the provisions of Relief Request 73 for one refueling cycle. Relief Request 73 requests NRC approval of for the life of Unit 1. Authorization of Relief Request 73 for an additional refueling cycle allows Unit 1 to restart from the ongoing RFO and provides time for the NRC to thoroughly review the relief request for the life of Unit 1. The NRC staff's evaluation and verbal authorization is repeated in the attachment to this e-mail. The following NRC and licensee personnel participated in the conference call.

NRC

Angie Buford, Chief of the Vessels and Internals Branch

Tony Nakanishi - Chief of the Plant Licensing Branch IV

William Orders - Project Manager, Plant Licensing Branch IV

Cory Parker, Materials Engineer, Vessels and Internals Branch

John Tsao, Senior Materials Engineer, Vessels and Internals Branch

ARIZONA PUBLIC SERVICE

Jill Anderson, Design Engineer

Francisco Diaz Gallegos, Licensing Engineer

Mike DiLorenzo, Licensing Department Leader

Nick Doyle, Design Engineering Section Leader

Maria Groshner, Licensing Engineer

Mike Hooshmand, Design Engineering Department Leader

William Hutchins, Licensing Engineer

Autumn Schuelka, Licensing Engineer

Jennifer Spina, VP Nuclear Regulatory and Oversight

Carl Stephenson, Licensing Advisor

Paul Yang, Design Engineer

Please contact me if you have any questions.

William Orders, Project Manager

Licensing Branch LPL4

Division of Operating Reactor Licensing

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VERBAL AUTHORIZATION
RELIEF REQUEST RR-73
REGARDING WELD REPAIR OF PRESSURIZER LOWER SHELL TEMPERATURE NOZZLE
ARIZONA PUBLIC SERVICE
PALO VERDE NUCLEAR GENERATING STATION, UNIT 1
DOCKET NO. 50-528

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

By letter dated December 10, 2024 (Agencywide Documents and Access Management System Accession No. ML24346A110), Arizona Public Service (the licensee) requested relief from 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 73 for U.S. Nuclear Regulatory Commission (NRC) review and approval to support 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 73 on the basis that it will provide for an acceptable level of quality and safety for the life of the repair.

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 TE101. The weld material was identified as Alloy 82. The examination results constituted defects in the primary coolant system that were unacceptable under the ASME Code, Section XI.

By letter dated October 23, 2023 (ML23296A254), as supplemented by letter dated October 26, 2023, (ML23299A305), the licensee submitted Relief Request 70 to perform alternative repair. In 2023, the licensee repaired the weld by removing the Alloy 82 weld pad on the outer diameter (OD) of the pressurizer shell and performing penetrant testing (PT). The licensee deposited a new Alloy 52M weld pad on the OD of the pressurizer using the machine gas tungsten arc welding (GTAW) process. The licensee stated that the repaired was made in accordance with the ASME Code, Section XI, and ASME Code Case N-638-10 with exceptions. The licensee performed 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 installed a new Alloy 690 nozzle and performed a partial penetration J-groove weld of the Alloy 690 nozzle to the Alloy 52M weld pad. The licensee performed progressive PT of the weld pad in accordance with the ASME Code Section II, NB-5245. On October 27, 2023 (ML23303A011), the NRC staff provided verbal authorization for Relief Request 70 and issued the written safety evaluation on September 9, 2024 (ML24197A199) applicable for Cycle 25 only.

Relief Request 73 is applicable to the same weld repair; however, the licensee is requesting relief for the duration of the currently licensed life of the plant, which ends on June 1, 2045. With respect to Relief Request 73 the NRC staff determined it is acceptable for one refueling cycle that the licensee took appropriate repair steps, including performing PT and UT without waiting for the 48-hour hold. The NRC staff determined that all required nondestructive examination per

Code Case N-638-10 was performed by qualified examiners and the examination procedure was qualified in accordance with the ASME Code, Section XI. The NRC staff noted that Alloy 52M weld material that was applied with machine GTAW process, which produces welds with very low diffusible hydrogen when compared to welding processes that use flux. Therefore, the NRC staff determined that 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 noted that operating experience has not shown any instances of hydrogen induced cracking out of the numerous weld overlays that have been completed by the nuclear industry using NRC-approved Code Case N-638.

As part of the technical basis, the licensee provided extensive modeling 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 staff determined that 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. Therefore, the staff determined that the proposed repair is acceptable for one refueling cycle.

Authorization read by Tony Nakanishi, Chief of the Plant Licensing Branch IV, Office of Nuclear Reactor Regulation:

As Chief of the Plant Licensing Branch IV, Office of Nuclear Reactor Regulation, I concur with the Vessels and Internals Branch's determinations.

Based on information submitted, the NRC staff finds that Relief Request 73 will provide reasonable assurance of the structural integrity of Pressurizer Lower Shell Temperature Nozzle TE101 and an acceptable level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed all the regulatory requirements set forth in 10 CFR 50.55a(z)(1). Therefore, as of April 10, 2025, the NRC authorizes the use of Relief Request 73 for one refueling cycle.

All other requirements of ASME Code, Section XI, for which relief was not specifically requested and authorized by the NRC staff remain applicable, including the 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.