Pre-Submittal Presentation - 1R25 PZR Nozzle RCV208 One-Cycle Justification - Relief Request 76

April 22, 2025

PaloVerde™ GENERATING STATION

Agenda

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  - Equipment Location
  - Flaw Identification
  - Design History
- ASME Section XI Code Requirements
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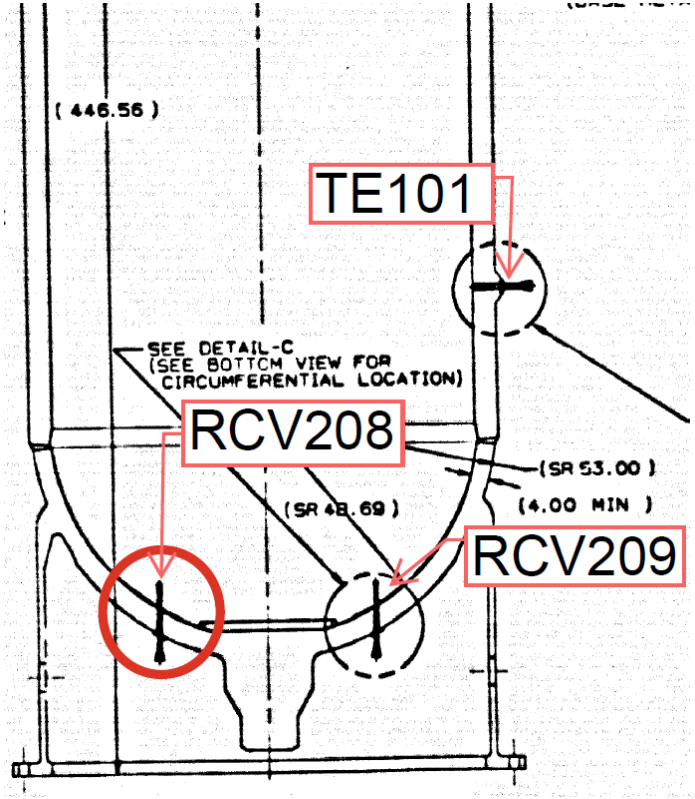
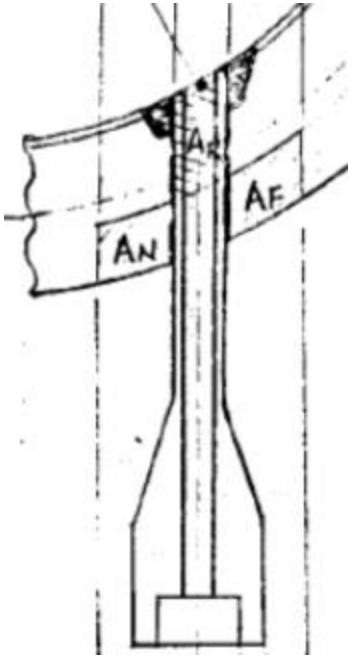
  - Flaw Removal and Evaluation
  - Welding
  - Basis for Alternatives
  - Duration of Proposed Alternative
  - Precedents
- Schedule
- Questions

Background – Equipment Location

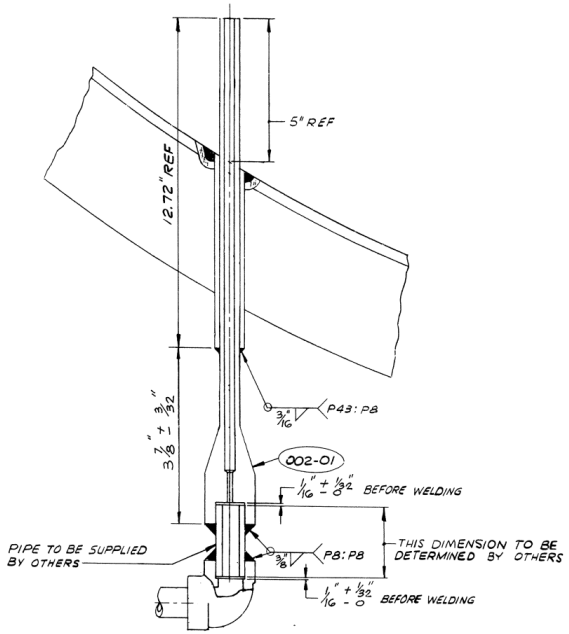


Background – Nozzle Design History



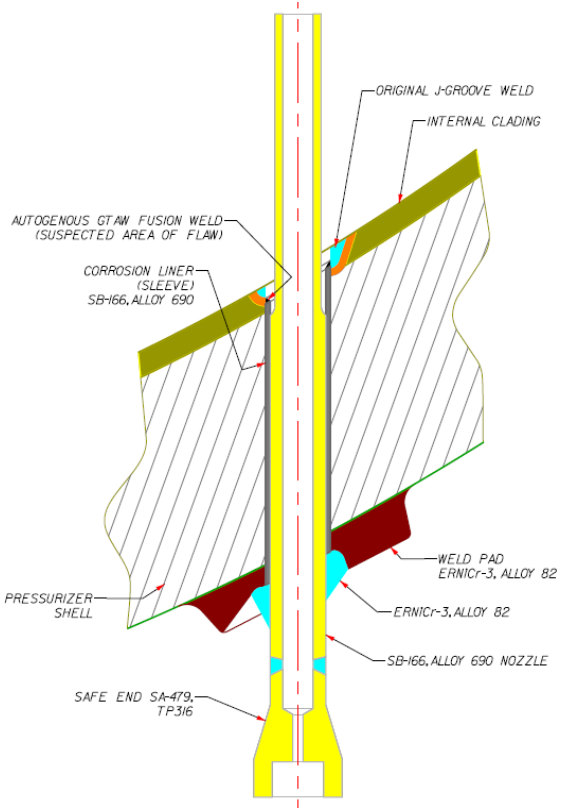
Original Nozzle → Alloy 600 & Weld → Alloy 82/182

Background – Nozzle Design History



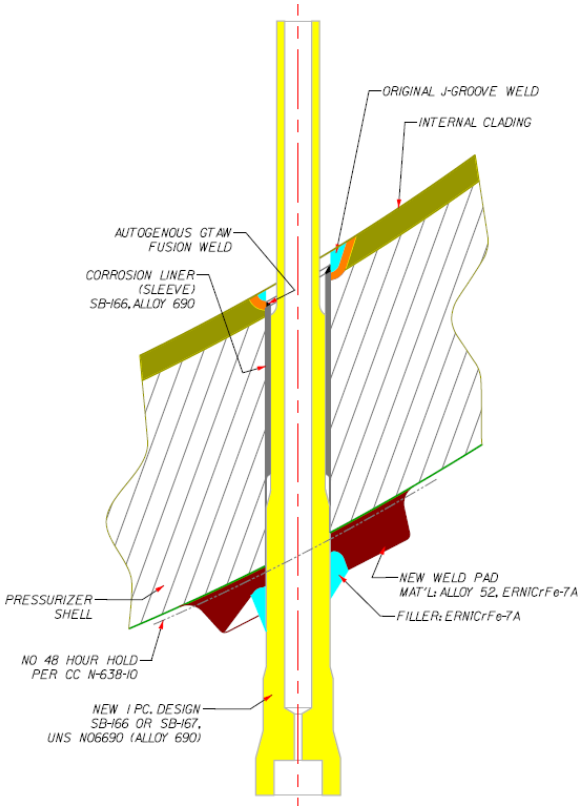
Post-1987: Nozzle → Alloy 600 & Weld → Alloy 82/182

Background – Nozzle Design History



Post-1992: Nozzle → Alloy 690 & Weld → Alloy 82

Background – Nozzle Design History

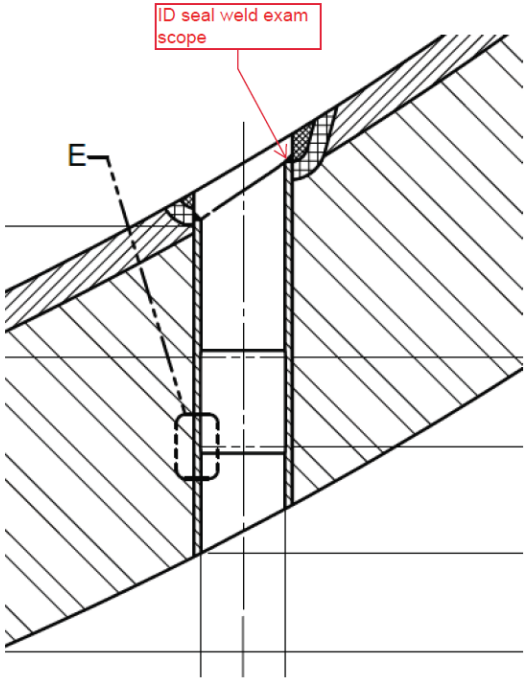


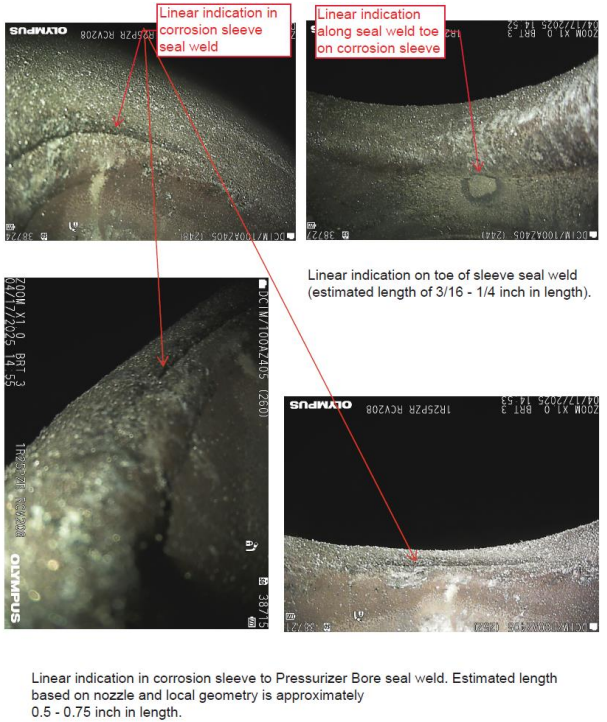
Post 2025 (1R25): Nozzle → Alloy 690 & Weld → Alloy 52M

Background – Welding Issues

- During the installation of RC-1911, PZR Nozzle RCL023/RCV208 encountered weldability issues between the corrosion sleeve and the vessel wall.
- Water was detected during a PT exam, as the oil-based PT materials were unable to penetrate between the corrosion sleeve and the V208 nozzle bore.
- Visual examination of the corrosion sleeve attachment to the original J-groove weld was conducted as part of weld troubleshooting issues.

Background – Flaw Identification





The visual examination detected indications in the autogenous (seal) weld.

Code Requirements

ASME Code, Section XI, 2013 Edition

IWA-4412 states "Defect removal shall be accomplished in accordance with the requirements of IWA-4420."

While seal weld is not pressure retaining, and no leakage present from RCS, relief requested due to age related flaws in the autogenous/original J-groove weld attached to the pressurizer shell

Flaw Removal

- Flaw removal required per IWA-4412/4420

Code Requirements

ASME Code, Section XI, 2013 Edition

Flaw Evaluation

- IWB-3142.1(b) states "A component whose visual examination detects the relevant conditions described in the standards of Table IWB-3410-1 shall be unacceptable for continued service, unless such components…" are accepted by supplemental evaluation, accepted by corrective measures, or accepted by analytical evaluation.

- IWB-3420 states, "Each detected flaw or group of flaws shall be characterized by the rules of IWA-3300 to establish the dimensions of the flaws."

- IWA-3300 states, "Flaws detected by… inservice examinations shall be sized…"

- IWB-2420(b) states, "If a component is accepted for continued service in accordance with IWB-3132.3 or IWB-3142.4, the areas containing flaws or relevant conditions shall be reexamined during the next three inspection periods…"

Proposed Alternative Pursuant to 10 CFR 50.55a(z)(1)

Flaw Removal and Flaw Evaluation

- As an alternative to flaw removal to meet the applicable acceptance standards per IWA-4412/4420, flaws in the original internal J-groove weld/autogenous weld will remain in place
- As an alternative to performing the nondestructive examination (NDE) required to characterize a flaw under IWB-3420, analyze a maximum postulated flaw that bounds the range of flaw sizes that could exist in the original internal J-groove weld

Proposed Alternative Pursuant to 10 CFR 50.55a(z)(1)

Welding

- In lieu of NB-4620 post weld heat treatment requirements, install Alloy 52M welded pad in accordance with ASME Case N-638-10, ambient temperature gas tungsten arc weld (GTAW) temper bead technique.
- An alternative is proposed to N-638-10, Paragraph 4(a)(2), that requires the first three tempering layers are in place for 48-hour prior to performing NDE.
- APS proposes to perform the NDE after welding is complete versus 48 hours after the third tempering layer is complete.

Proposed Alternative Pursuant to 10 CFR 50.55a(z)(1)

Basis for Alternatives

- A review of previous analyses has been performed and confirmed that the As Left J-Groove Weld Analysis is acceptable for at least one operating cycle
- White paper supporting elimination of 48-hour hold in Code Case N-888-1
- Loose Parts analysis
- Corrosion analysis

Proposed Alternative Pursuant to 10 CFR 50.55a(z)(1)

Duration of Proposed Alternative

- Relief is requested for the duration of the Unit 1 Cycle 26 which concludes Fall 2026
- Separate relief request to be submitted for continued use of the nozzle for the life of the plant prior to the end of the cycle

Proposed Alternative Pursuant to 10 CFR 50.55a(z)(1)

Precedents

- NRC approval via verbal authorization on November 6, 2020 (ML20314A028) for Peach Bottom Atomic Power Station, Unit 2. Safety Evaluation April 23, 2021 (ML21110A680)
- NRC verbal authorization on April 15, 2012, for Quad Cities, Unit 2 (ML12107A472). Safety Evaluation January 30, 2013 (ML13016A454)
- NRC approval via a verbal authorization on May 17, 2017, for Limerick, Unit 2 (ML17137A307). Safety Evaluation August 14, 2017 (ML17208A090)
- NRC verbal authorization on May 9, 2023 (ML23129A312) for Beaver Valley, Unit 2 (ML23118A381) and Letter from David Gudger (Constellation Energy Generation) to NRC dated March 24, 2023, ADAMS Accession No. ML23083B991
- PVGS Relief Request 70 verbal authorization (ML23303A011) and written authorization (ML24197A199) for 1 refueling cycle repair approval (U1 TE-101)
- PVGS Relief Request 73 verbal authorization (ML25104A042) for an additional refueling cycle (U1 TE-101)

Schedule

- Proposed submittal date for RR-76
  - April 23, 2025
- Requested verbal authorization date
  - April 27, 2025
- Proposed submittal date for final one-cycle flaw analytical evaluation
  - 14-days after the end of the Unit 1 outage

Questions?