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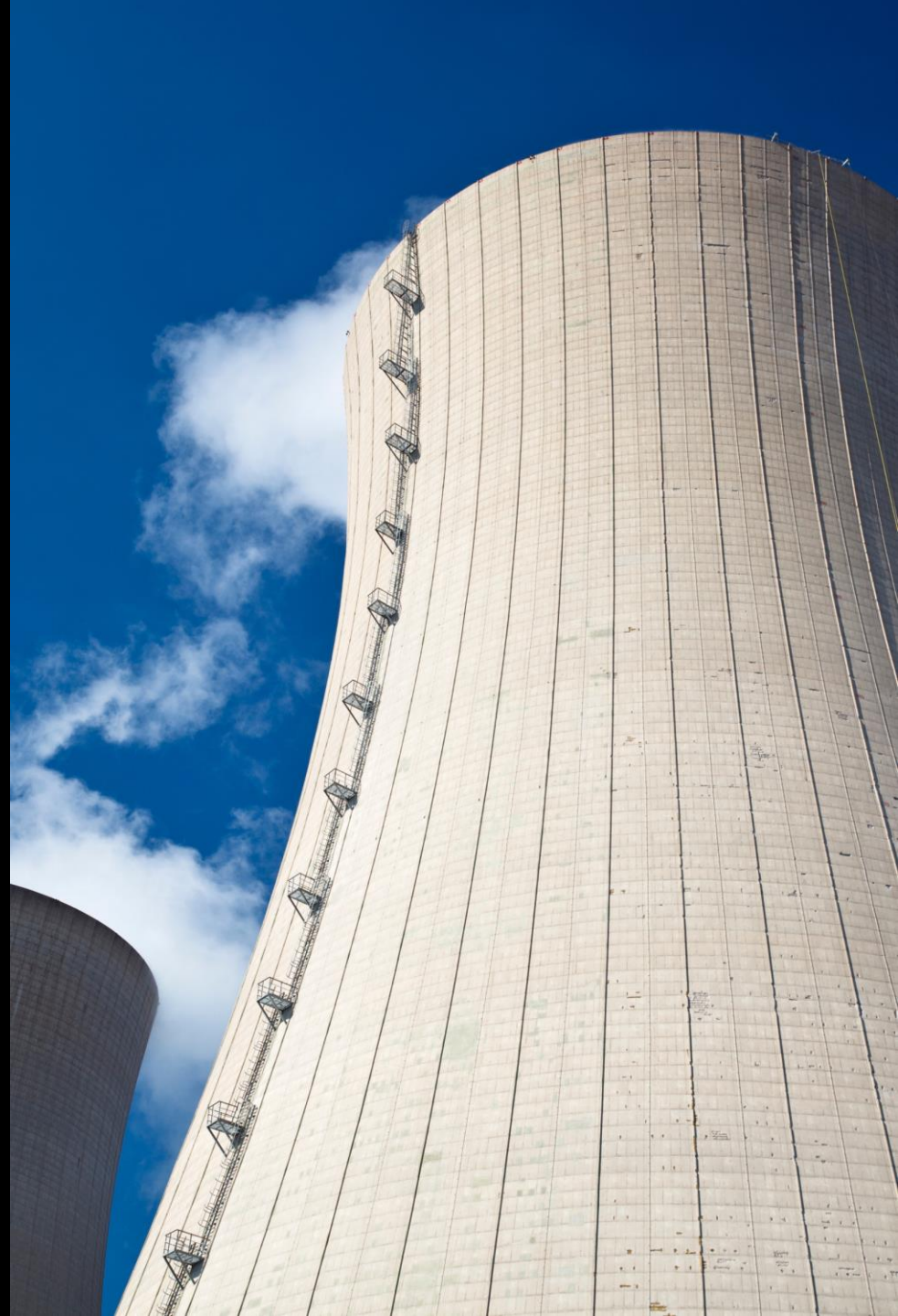
October 15, 2024

NRC Brief on ANO-2 2R30 Nozzle 71 Half Nozzle Repair



Agenda

1. Problem Statement
2. Proposed Solution
3. Project Schedule
4. Comments / Questions

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Problem Statement

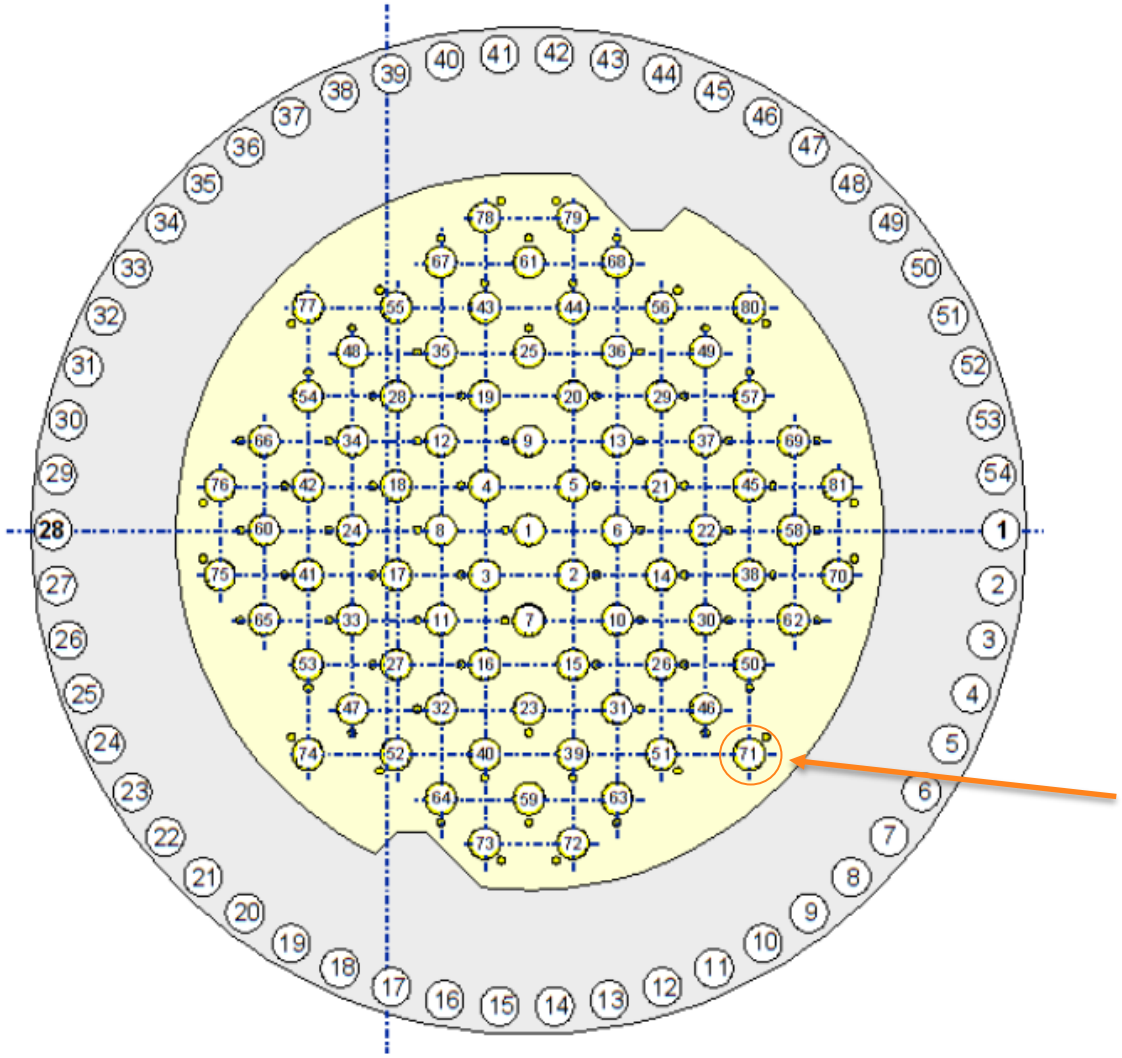
During performance of the RVCH inspection in accordance with Code Case N-729-6 and Relief Request ANO2-ISI-022, an indication was found on Control Element Drive Mechanism (CEDM) Penetration 71.

A manual surface examination using Liquid Penetrant (PT) was performed in an attempt to establish surface connectivity.

Nozzle 71 Location

- Outermost Row
- 49.6° angle of incidence

- No fabrication flaws or special interest indications previously noted on CEDM 71 at this location



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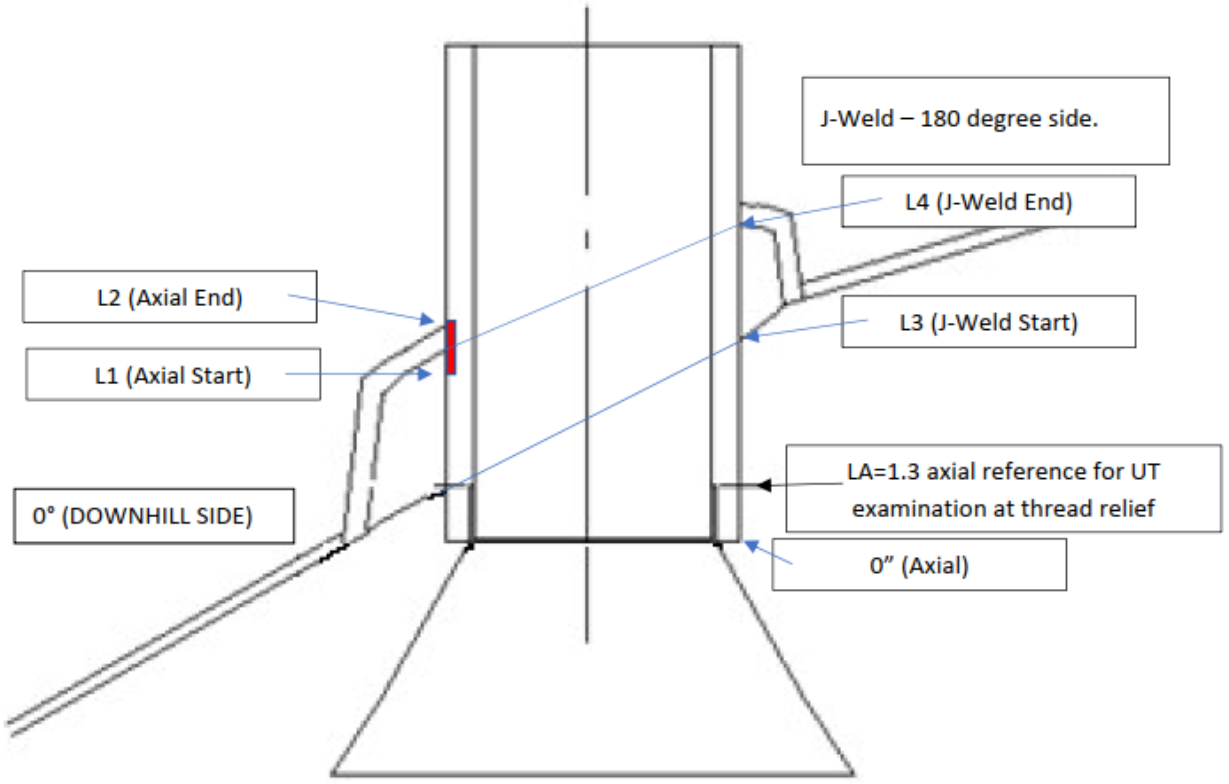
Nozzle 71 Indication

- Bare metal visual on top of head – No visible leakage
- Clean UT leak path assessment
- Clean Eddy Current from tube ID
- UT indication 0.44” long by 0.195” deep in tube on downhill side located along the top of the J weld

- *Clean Eddy current on J weld surface and tube OD (augmented exam)

Penetration 71 J-Weld Ultrasonic Indication # 1 (Rev. 0.2**)



Penetration Tube/J-weld Repair Diagram

INDICATION SKETCH – NOT TO SCALE

Indication Axial Start (L1)	Indication Axial End (L2)	J-Weld Start (L3)	J-Weld End (L4)	Indication Degree Location*	Depth of Indication into Tube Wall (from tube OD)	Comments
2.58”	3.02”	1.31”	2.78”	2°	0.195”** in the tube wall	Axial Indication on Downhill Side

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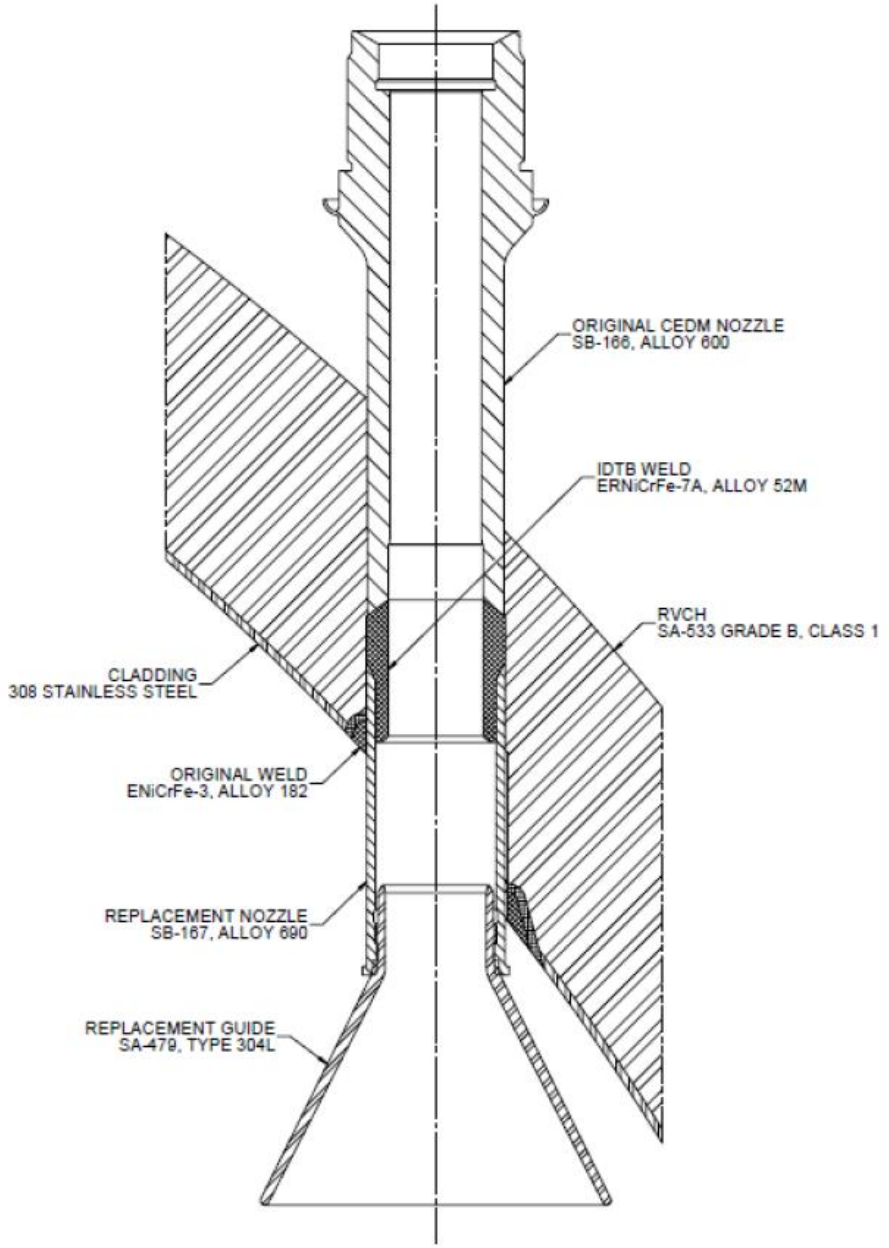
Evaluation

- Rapid appearance and growth suggested PWSCC
- Fatigue crack considered but concluded to be unsupported
- Potential surface connection using PT
- Undetected growth of cracks thru welds supported by internal OE at Indian Point 2 in 2018

Decision made to proceed with half nozzle repair with Framatome



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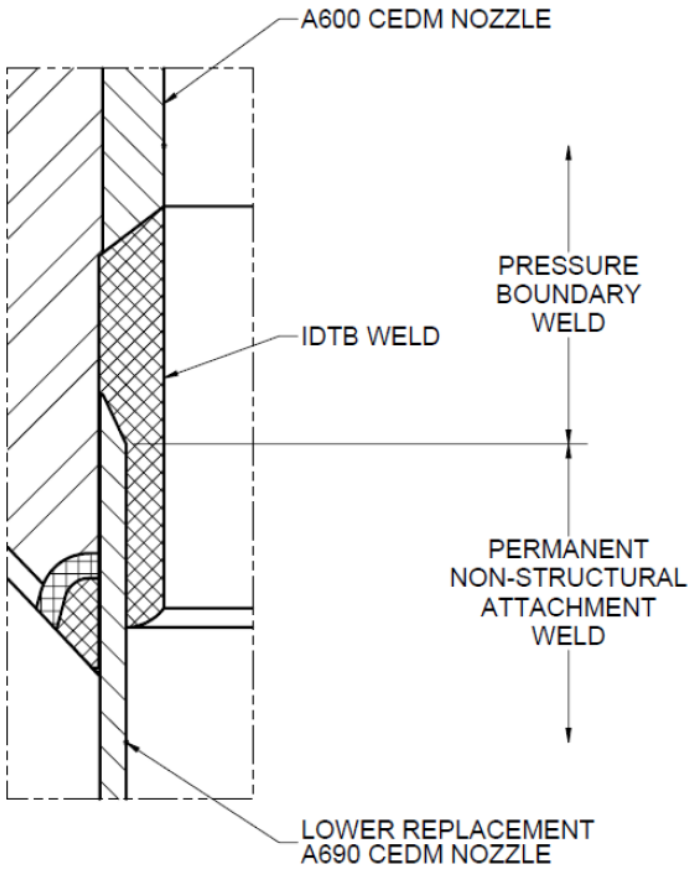
Half-Nozzle Repair



- No significant change in the repair process, except roto-peening will not be performed for this repair.
- To address this, Entergy will provide:
  a. The highest weld residual plus operating stress through-wall profile of the nozzle adjacent to the weld and the rolled-expanded regions.
  b. The estimated crack growth rate for the roll-expanded region.
  c. The hydrogen concentration expected during the next cycle of operation.

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Project Schedule

Milestone	Target Date
Request Submitted	10/20/2024
Request Authorization	10/22/2024
Field Work Completed	10/22/2024
Return to Service	10/24/2024
One-Cycle Justification Analyses	Within 14 Days After Startup
“Life of Repair” Analyses	Prior to 2R31 (2nd Quarter 2026)

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Questions?