Reactor Coolant Pump Nozzle WOL

"First of a Kind" Weld Overlay (WOL) repair of reactor coolant pump nozzles

Davis-Besse Alloy 600 Weld Overlay (WOL)

WSI successfully provided project planning and "First of a Kind" WOL repairs for Alloy 600 Reactor Coolant Pump (RCP) Nozzles and other locations at the Davis-Besse Nuclear Plant in Port Clinton, Ohio. The WOL repair tasks were performed with proprietary remote operated automated technology – including training, full fidelity mockup, equipment, filler material, welding, and requisite surface preparation – demonstrating several singular and innovative delivery methodologies. This experience (and OWOL) applies directly to CE & B&W units for their RCP Nozzles with Alloy 600; and applies directly to Westinghouse units for their Reactor Vessel Nozzles with Alloy 600.

The design and preparation process for this project took about eighteen months. The initial three month period focused on tooling/weld process development which was followed by a full fidelity mockup, site planning, and crew training. All tools, processes, and repair technology were tested and validated at WSI's state-of-the-art facility.

Repair design licensing support, and ultrasonic NDE were provided by Structural Integrity. Project planning and support were provided in partnership with FENOC Davis-Besse.

Scope Details:

- Optimized weld overlay of four 34" RCP discharge nozzles -industry FOAK configuration
- Structural weld overlay of four 34" RCP suction nozzles - industry FOAK configuration
- Weld overlay of two 14" Core Flood Nozzles (CFNs) - industry FOAK configuration - making WSI the only vendor to repair CFNs with both an Onlay and an Overlay technique
- Weld overlay of three 2-1/2" Drain Nozzles

Highlights:

Weld overlay mitigation of 13 nozzles - Several "First of a Kind" achievements were earned - including:

- NRC approval of the FENOC Weld Overlay Relief Request - the industry's first installation of an Optimized WOL (OWOL) - making Davis-Besse one of the industry's leaders in Alloy 600 mitigation.

General Background/Comments:

- No safety incidents
- Deployed 162 people to site
- No rejectable indications in any of the 13 final overlays
- Responded to "as found" CFN high dose rates and completed the work (dose rates ~ 5x higher than planned)
- Successfully responded to one "as found" Drain Nozzle configuration condition and completed the work (required some WOL redesign)

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