

Inside Diameter Temper Bead

RV Head Repairs

Framatome's CRDM Nozzle Inside Diameter Temper Bead welding repairs maximize component life while reducing personnel dose and costs.

Challenge

History shows that leakage occurs through flaws in the partial penetration attachment weld between the Reactor Vessel Head and Control Rod Drive mechanism (CRDM) nozzle as well as through the CRDM nozzle wall in Alloy 600 nozzles.

Solution

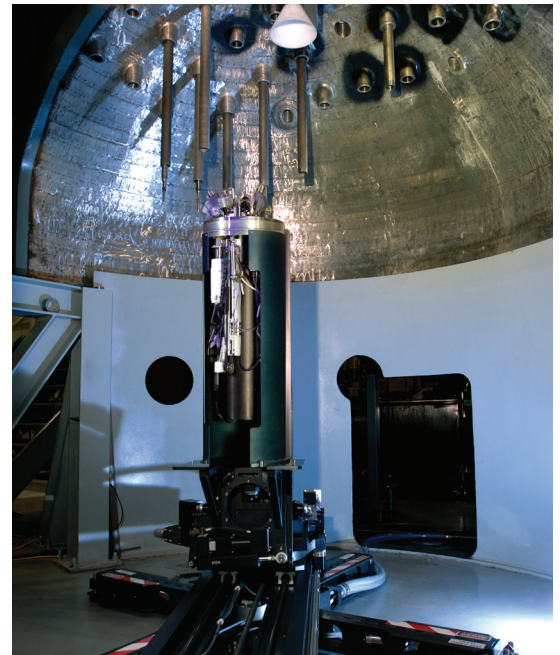
The flaws, identified as Primary Water Stress Corrosion Cracking (PWSCC) in the weld and nozzle, are repaired using a Framatome-developed technique. It utilizes remotely operated automated equipment to reduce the extensive time and dose resulting from performing manual repairs.

Framatome offers the **ONLY** proven approach for remotely operated repair of CRDM and Core Exit Thermocouple nozzles that addresses all flaw scenarios utilizing our remote Inside Diameter Temper Bead (IDTB) repair.

The IDTB repair provides a new pressure boundary weld with PWSCC-resistant material — superior to the overlay repair which leaves embedded flaws in the material and has led to rework.

Since 2000, the Framatome IDTB weld repair has been performed on over 160 nozzles in Westinghouse, CE, B&W, and other plants, and is readily applicable to your situation.”

Framatome has never had to perform a welded repair to previous IDTB repairs.



Customer benefits

- The **ONLY** repair that addresses all PWSCC flaw scenarios
- Requires much less weld volume than other repair approaches, minimizing risk & schedule
- Remote delivery and application of tooling reduces personnel exposure
- Maximizes repair life with surface remediation of the original nozzle remnant, the new weld, and the Heat Affected Zone
- Save time and cost by eliminating pre-weld and post-weld heat treatment

Your performance
is **our** everyday **commitment**



Features

- Moves highly stressed attachment weld to a region with no PWSCC degradation or flaws
- Geometry is symmetric which offers improved weldability and inspectability characteristics
- Does not leave embedded flaw in material
- Has been approved many times by the U.S. Nuclear Regulatory Commission through relief request submittal

Highlights of the Framatome Repair Process

- Thermal sleeve removal (if applicable)
- Roll nozzle in repair region
- Machine weld prep & PT weld area
- Perform ambient temperature temper bead structural weld
- Prepare welded surface for NDE
- Perform post-repair UT & PT
- Remediate rolled and repaired areas
- Install replacement thermal sleeve (if required)

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