ELECTRIC POWER RESEARCH INSTITUTE

Inspection & Mitigation of Alloy 82/182 butt welds with Overlays

Industry Briefing to NRC on PWSCC Mitigation Research-Rockville

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Inspection & Mitigation of Alloy 82/182 butt welds

Project Description

- **Fabricate samples to support the following tasks:**
  - Obtain mitigation data to support the application of OWOL (Optimized design) on large diameter components
  - Develop procedures and techniques to examine cast SS base material under weld overlays
  - Develop procedures and techniques to examine beyond the outer 25% of the original base material in order to reduce the size of the overlay for large diameter thick components
  - Develop code criteria in order to qualify the techniques developed
  - Expand currently qualified procedure thickness ranges

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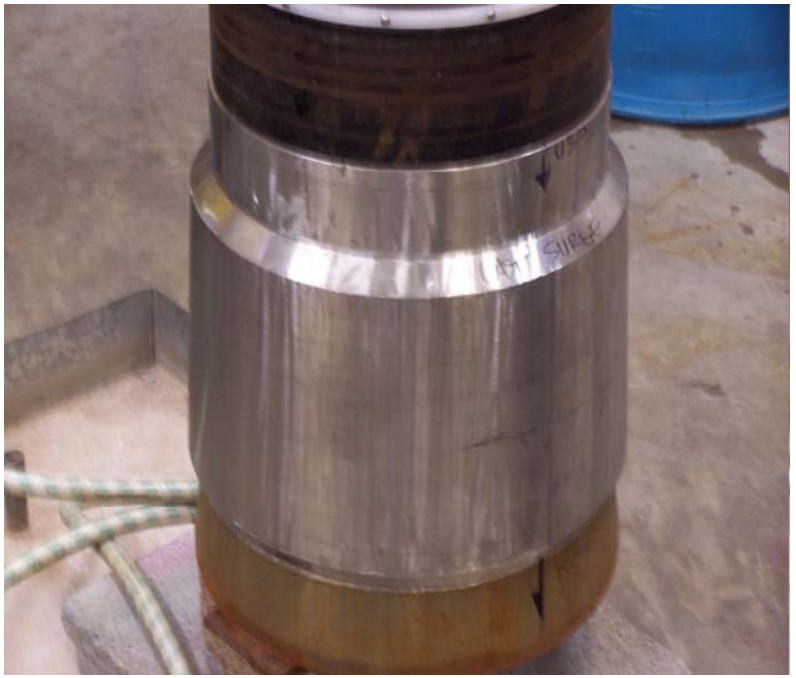
Tasks & Deliverables

- MRP Funded Portion
  - Smaller Diameter Configurations
    - All have cast safe-ends
    - Surge Line Mock-ups have flaws at 50% and 75% of the original weld and base material thickness
    - Flaws located in cast base material and in weld
    - Delivered in January of 07
      - Samples being scanned by vendor
      - Results under review



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- **Tasks & Deliverables**
  - MEOG/NDEC/MRP Projects
  - Design and fabricate large diameter thick test samples (RCS)
    - *February 2008 (Complete)*
    - *Document Mitigation Design Data 2008*
    - Characterize samples and evaluate techniques
      - *December 2008 (Data Collection Complete and Analysis Underway on Expedited Schedule to support Pilot Plant)*
    - *If above task is successful, qualify techniques*
      - *December 2008*

      (First Application for Preemptive Overlay Targeted for September 08, if techniques are successful 3 months early)
    - *Complete Relief Request Template*
      - *November 2008 (Working with Pilot Plant on Expedited Schedule)*

Summary of Overlay UT Results

Thin Non-Cast
Detect Circ & Ax
Beyond Outer 25%
Refining sizing techniques

Heavy Non-Cast
Detect & Size Circ & Ax in outer 25%
Detect Circs beyond outer 25%

Thin Cast
Limited Detection of Circ & Ax flaws (Some flaws missed)
No sizing

Heavy Cast
No detections
No sizing

Inspection & Mitigation of Alloy 82/182 butt welds

- Inlays and Onlays
  - Coordinated with PWROG to show that current PDI qualified techniques are effective for ISI of butt welds after application of Inlay
    - Fabricated Large Main Loop Inlay mock-up
    - Demonstrated equivalency of currently qualified inside surface procedures
    - Documented results
  - Working with utility on the application of onlay mock-ups for Core Flood nozzle configurations