



PDI Dissimilar Metal Weld Program Status

June 4th -5th 2003

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Performance Demonstration**

EPRI NDE Center



Fabrication

▲ All samples delivered and in use



Outside Surface Examinations

^ Manual

- 19 Personnel are qualified for detection with limitations 19/35 (54%)
- 11 Personnel are qualified for Detection and length sizing with limitations
- No successful candidates to date for depth sizing
 - 14 Attempts
 - >0.125"



Outside Surface Examinations

▲ Automated

- 2 vendors have qualified procedures for detection and length sizing
 - General Electric
 - Framatome ANP
- Both procedures are limited to primarily BWR configurations/thickness
 - No tapers or transitions
- Depth sizing outside of acceptable limits
 - >0.125 "RMS
- A total of 6 candidates have successfully qualified for detection and length sizing (6/6) 100%



Inside Surface Examinations

^ WESDYNE has attempted qualification for main loop piping welds for Westinghouse, Combustion and B&W style reactors

– Results

- Supplement 3
 - *Qualified for detection, length and depth sizing*
- Supplement 2
 - *Limited qualification for detection and length sizing*
 - *Not qualified for axial flaw detection in closure weld configurations*
 - *Depth sizing outside of acceptable limits*
 - *>0.125"RMS*
- Supplement 10
 - *Same as Supplement 2*
 - *Did not attempt qualification for Core Flood (12.0" Dia.) and Safety Injection (4.0" Dia.) configurations*



Inside Surface Examinations

▲ **Framatome**

- Attempted
 - Supplement 3 qualification for main loop piping welds for Combustion /B&W style reactors
 - Supplement 10 qualifications limited to Core Flood welds unique to B&W style reactors (12.0" Diameter)
- Results
 - Supplement 3
 - *Qualified for Detection Length and Depth Sizing*
 - Supplement 10
 - *Limited qualification for detection and length sizing*
 - Scan surface must be machined smooth and allow full access from both sides of the weld
 - *Depth sizing outside of acceptable limits*
 - $>0.125''$ RMS



Examination Schedules

^ Inside Surface Examinations

- 5 vessel examination scheduled for fall
 - Framatome - 4
 - *Prairie Island*
 - *Oconee*
 - *Catawba*
 - *Fort Calhoun*
 - WESDYNE - 1
 - *VC Summer*

^ Outside Surface Examinations

- Various BWR and PWR examines



Demonstration Schedule

▲ Inside Surface Examinations

- 2 vendors scheduled for June-August time frame
 - Framatome (June-August)
 - *Attempt qualifications for*
 - *Main loop Westinghouse configurations*
 - *Westinghouse safety injection configurations*
 - *Additional work to improve depth sizing capability is also planned*
 - WESDYNE (June-August)
 - *Work on improving detection and depth sizing techniques*
 - *Expand on qualification ranges*
 - IHISWT (Fall 2003)
 - *Phase I (Open Demonstration)*
 - *Have scanned 50% of open pieces and are working on procedure*



Demonstration Schedule

▲ Outside Surface Examinations

- Automated
 - General Electric (Underway)
 - *Working on improving TWS technique*
 - WESDYNE (June- August)
 - *Procedure and personnel qualifications*
- Manual
 - 60 candidates scheduled (June -August)
 - *Variety of qualifications, but mainly Supplement 10*



Practice Samples

▲ Practice samples available for inside surface qualifications

- Westinghouse Main Loop Inlet and Outlet configurations
 - Supplements 2 and 10
- No practice samples for Supplement 3 or for Core Flood and Safety Injection

▲ Work underway to design and fabricate practice set for outside surface examinations

- Funding approved
 - 400K
- Present Plan
 - Rework existing R&D samples
 - Fabricate new samples
 - Samples may include notches for calibration and search unit evaluation
- Fabrication to start in June/July time frame



Dissimilar Metal Weld Guided Practice and Training

^ 2 separate actions

- Guided Practice
 - Similar to piping
- Training
 - Formal training class with hands on training
 - PDA to provide technical content to class
 - *Cracking History*
 - *Proven techniques*
 - *Detection, Sizing*
 - *Procedure Orientation*
 - EPRI training department to administer
- Schedule
 - Targeting Fall 2003



Summary

- ^ **A great deal of progress has been made, but there is still a lot of work left to achieve code required performance**
 - Inside surface examination limitations and depth sizing are the biggest challenges ahead
 - Continue to work on depth sizing procedures in an effort to obtain acceptable results for both manual and automated applications
 - Better search units
 - Refined techniques
 - *Profilometry*
 - *Phased array*
 - Training
 - Senior PDA staff will be working with vendors and utilities full time
 - Helping with technique development (if needed)
 - Facilitating demonstrations
 - Documenting results



Summary

- ^ Utilities are working together to;**
 - Track progress**
 - Provided resources as needed**
 - Develop relief requests**
 - Address flaw evaluation**
 - Planning for alternative examinations**
 - Reviewing configurations to assure they are covered**