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Qualification of RPV Head Instrument Nozzle Volumetric Examination Status

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Outline

- New Qualification Requirements
- Ultrasonic Examination Qualifications
- Current UT Procedure Qualification and Examination Status
- Remaining UT Procedure Qualification Schedule
- Leak Path Qualification and Examination Status
- Limitations
- Future Work
- Summary

New Qualification Requirements for Upper Head Penetration Examination

- As of September 2009, all UT examinations of penetration tube volume must be performed with qualified procedures, personnel and equipment
 - 10CFR50.55a, CC N-729-1, and the MRP Protocol govern the qualification activities
- Leak Path UT examinations must be performed by qualified personnel
 - Qualified through blind testing
- Leak Path UT procedures are qualified in accordance with ASME Section V, Article 14
 - Demonstrated through vendor quality assurance program and documented in technical justification
 - Technical justification reviewed by PWROG and MRP/EPRI
 - RES receives copy of approved TJ's
- Eddy Current examinations are not included in the qualification requirements of 10CFR50.55a, but are demonstrated through vendor quality assurance program and documented in technical justification
 - Owner reviewed and approved

Ultrasonic Examination Qualifications

- All ultrasonic qualifications are administered by the EPRI NDE performance demonstration program
 - Same personnel that supports industry PDI program
 - QA program merged with PDI program
- Upper Reactor Head Penetration ultrasonic qualifications started in June of 2009
 - Three vendors have participated to date
 - 5 procedures have been qualified
 - 1 additional procedure in qualification now

Current UT Procedure Qualification and Examination Status

- Westinghouse
 - Qualification Status
 - Completed initial procedure qualification on CRDM/CEDM configurations in early September 2009
 - Qualified open housing probe and blade probe
 - Returned to EPRI in mid September 2009 and qualified a “combo” blade probe equipped with both axial and circumferentially oriented TOFD
 - Returned to EPRI in February 2010 and qualified a narrow combo blade probe for specific plant thermal sleeve configuration
 - Currently have 12 people qualified for detection and 8 for leak path
 - Examination Status
 - Performed 4 examinations to date

Current UT Procedure Qualification and Examination Status

- AREVA
 - Qualification Status
 - Completed initial procedure qualification on CRDM/CEDM configurations in early February 2010
 - Qualified blade probe and open housing procedure qualifications
 - Intent to return to qualify additional search units and address site specific configurations
 - Examination Status
 - Currently have 9 people qualified for detection and 3 for leak path
 - 1 head examination has been performed
 - 1 pre-service underway
 - 1 pre-service to start within few weeks

Current UT Procedure Qualification and Examination Status

- TECNATOM
 - Qualification Status
 - Currently at EPRI attempting to qualify on CRDM/CEDM configurations with both a combo blade and an open-housing probe
 - Open housing procedure qualified working on blade probe procedure and leak path personnel qualifications
 - Scheduled to complete by the end of May
 - Currently have 4 people qualified for detection and have yet to take leak path tests
 - Examination status
 - No examinations have been performed to date
 - 1 examination scheduled - Summer 2010

Remaining UT Procedure Qualification Schedule

- AREVA
 - Scheduled to return to EPRI for site-specific CRDM and ICI qualifications from mid July to early August
 - Have indicated a desire to qualify a combo blade probe in June
- Doosan
 - Scheduled to attempt CRDM/CEDM qualification with both combo blade probe and open-housing probe from early September to early November
- Inetec
 - Not yet on schedule, but looking at January 2011 timeframe
- MHI, KPS and KHNP
 - Have contacted EPRI for available dates

Leak Path Qualification and Examination Status

- Westinghouse & AREVA TJ's updated by PWROG and reviewed and approved by EPRI/MRP
- TJ's submitted to the NRC (information only)
- A total of 11 analysts qualified at EPRI
- Four inspections have been performed by WEC
- One inspection has been performed by AREVA
 - Currently performing base line examination

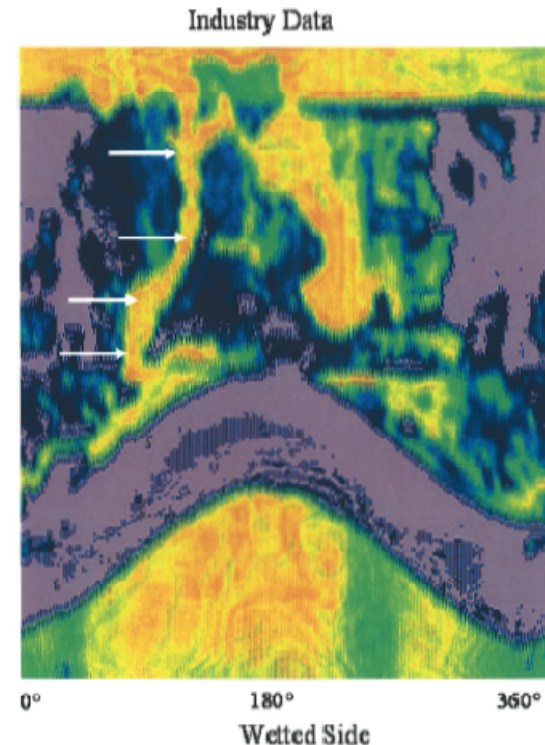
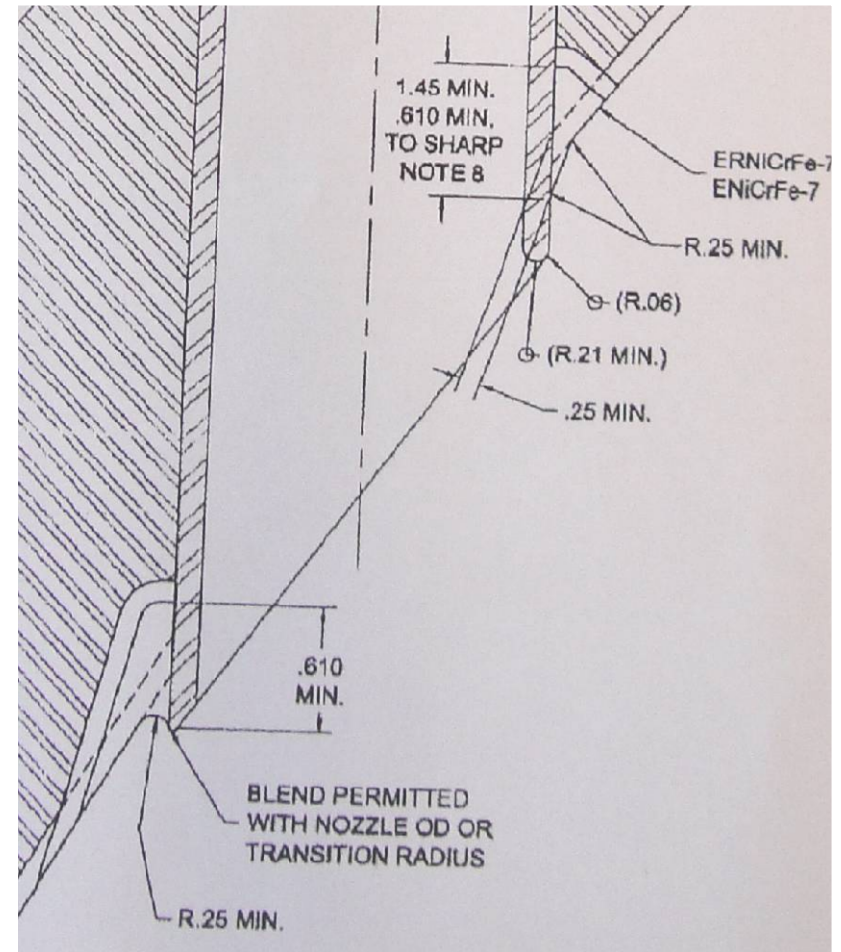


Figure 7: Industry-acquired ISI data taken to detect and characterize the presence of any leakage path in Nozzle 31. The alleged leakage path is shown with the white arrows.

Limitations

- No vendor has been successful on standard CE ICI configurations
 - Challenging configuration for tooling and ultrasonic technique
 - Due to angled cut at penetration end and proximity of attachment weld to end of penetration
 - Only present on a certain vintage of CE designed reactor heads
 - Current examinations performed with eddy current from inside surface and best effort UT of limited coverage area
 - Relief request needed

ICI Configuration (design drawing)



Future Work

- Fabrication of additional samples to be included into program
 - Vent Line
 - ICI
 - Additional CRDM samples including Leak Path
 - Site specific configurations

Summary

- Two vendors have successfully completed qualification for CRDM/CEDM and have performed qualified examinations
- A third vendor is currently qualifying and others are planned for 2010 and 2011
- Upper Head Penetration Qualification Program challenges still exist
- EPRI and industry working together in implementation of program