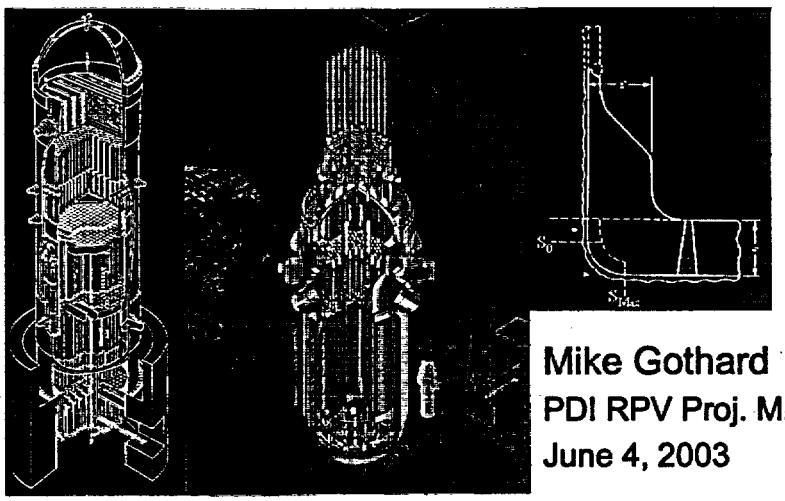
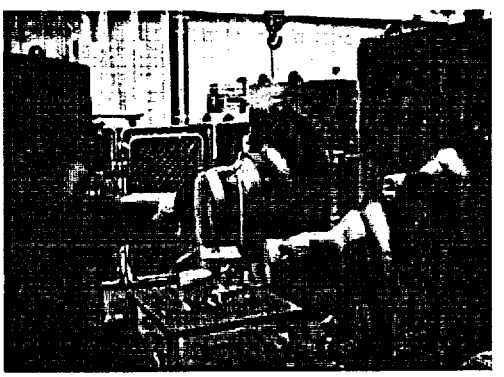
PDI/NRC - Meeting



Mike Gothard
PDI RPV Proj. Mngr.
June 4, 2003

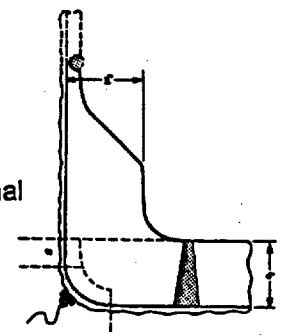
Status of RPV Demonstration Program

- **Introduction**
  - Supplement 5 Update.
    - Nozzle inside radius section.
  - Supplement 7 Update.
    - Nozzle to vessel welds.
  - Current Status.
    - PDI/RFR.
    - PDI/ASME.
    - PDI/Rule.



Status of RPV Demonstration Program

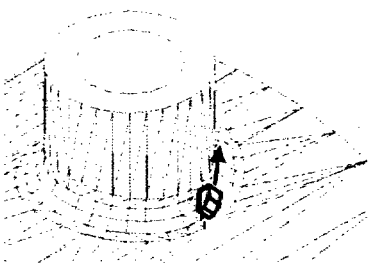
- **Supplement 5 – From the ID (PWR)**
  - Most utilities electing to do enhanced VT-1 exams.
  - One vendor qualified automated (limited).
    - Detection – 4 individuals.
    - Sizing – 4 individuals.
  - One vendor collected automated conventional and phased array data.

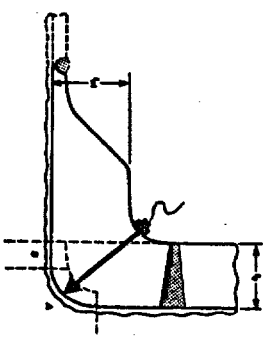


Nozzle Inside Radius Section

Status of RPV Demonstration Program

- **Supplement 5 – From the OD (BWR)**
  - Code Case N-552 per 10CFR50.55a...(xv)(J).
  - Compound curvature requires modeling.

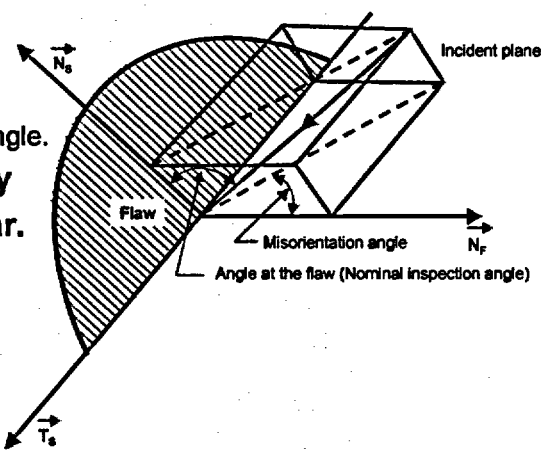




Nozzle Inside Radius Section

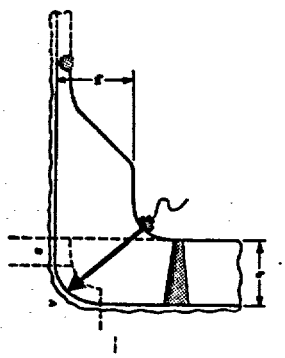
Status of RPV Demonstration Program

- **Supplement 5 – From the OD (BWR)**
  - Modeling establishes:
    - Misorientation angle.
    - Maximum metal path.
    - Nominal inspection angle.
- **Forward plotting utility scheduled for this year.**



Status of RPV Demonstration Program

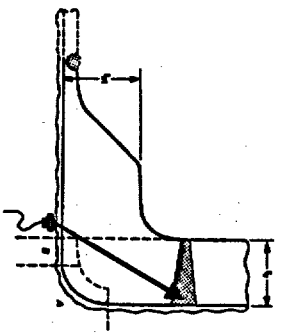
- **Supplement 5 – From the OD (BWR)**
  - One vendor qualified automated.
    - Detection – 5 individuals.
    - Sizing – 4 individuals.
  - One vendor qualified manually.
    - Detection – 6 individuals.
    - Sizing – 2 individuals.
  - One vendor qualified manually.
    - Detection – 3 individuals.
    - Sizing – 1 individual.
  - Additional vendor qualified manually
    - Detection - 5 individuals.
    - Sizing – 7 individuals.



Nozzle Inside Radius Section

Status of RPV Demonstration Program

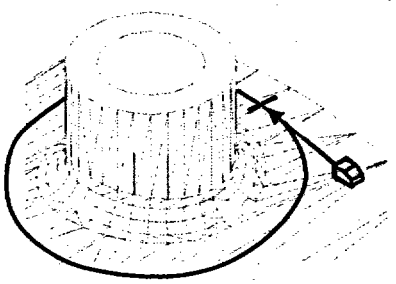
- **Supplement 7 – From the ID (PWR)**
  - Augmented examination to obtain 4 direction coverage in the inner 15% and radial coverage in outer 85%.
  - One vendor qualified automated.
    - Detection – 6 individuals.
    - Sizing – 6 individuals.
  - One vendor qualified automated.
    - Detection – 3 individuals.
    - Sizing – 3 individuals.
  - One vendor acquired automated conventional and phased array data.

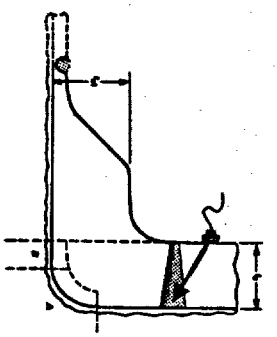


Nozzle to vessel weld

Status of RPV Demonstration Program

- **Supplement 7 – From the OD (BWR)**
  - Code Case N-552 – Extension of Supplement 5 Qualification for inner 15% circumferential scans per 10CFR50.55a...(K)(3)(I). Compound curvature requires modeling.

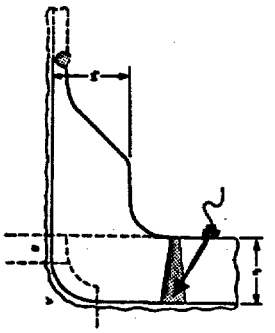




Nozzle to vessel weld

Status of RPV Demonstration Program

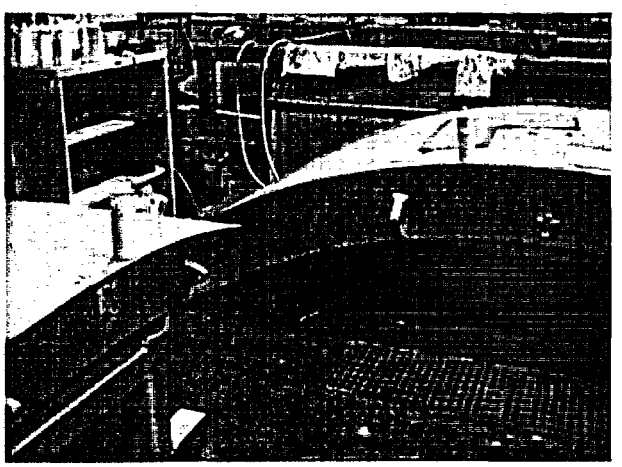
- **Supplement 7 – From the OD**
- **Procedure extension = Supplement 5**
  - One vendor qualified automated
    - Detection – 5 individuals.
    - Sizing – 4 individuals.
  - One vendor qualified manually.
    - Detection – 6 individuals.
    - Sizing – 2 individuals.
  - One vendor qualified manually.
    - Detection – 3 individuals.
    - Sizing – 1 individual.
  - Additional vendor qualified manually.
    - Detection – 5 individuals.
    - Sizing – 7 individuals.



Nozzle to vessel weld

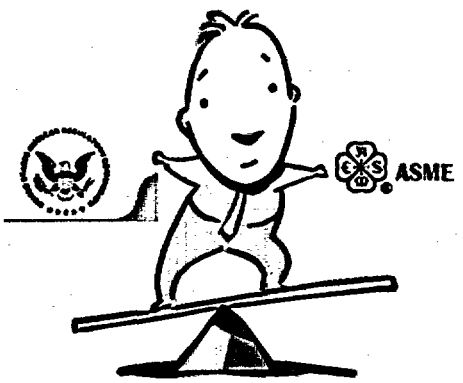
Status of RPV Demonstration Program

- **Supplement 4 and 6 OD Thickness Expansion**
  - 6.88" to 11.07"
  - One vendor
    - Automated.
      - *Detection.*
      - *Sizing.*
      - *Single side access.*
    - Manual.
      - *Detection.*
      - *Sizing.*
      - *Dual side Access.*



Relief Update

- **Required Reliefs**
- **Suggested Reliefs**
- **Requests for Additional Information**



Relief Update

- **Required Reliefs**
  - Supplement 10, Rev. 2 (ALL)
  - Supplement 14, Rev. 2 (PWR)
  - Supplement 11, Rev. 1 (Weld-overlay)
  - Supplement 4, paragraph 3.2(c) (ALL)
- **Suggested Reliefs**
  - Code Case N-613-1 (Reduction to ½" exam volume for nozzles)
  - Code Case N-648 (Enhanced VT in lieu of Supplement 5)
  - Code Case N-663 (UT in lieu of PT)
- **Requests for Additional Information**
  - Incorporated into Supplement 11
  - Incorporated into Supplement 10 and 14
  - Received for Code Case N-613-1

RPV Related Code Activities

- **Current activities**
  - Revised Supplement 5 to address modeling (CC N-552) including lessons learned.
  - Revised Supplement 7 to address augmented bore qualification, modeling, including lessons learned.
- **Future Activities**
  - Remove off-axis flaw requirements from Code and next Rulemaking.
    - Flaws detected length and depth sized by qualified:
      - *Shear wave techniques*
      - *Longitudinal wave techniques*
      - *Bimodal (tandem) techniques*

Piping Related Code Activities

- **Completed Activities**
  - Revised Supplement 10 to include:
    - Alternative flaw mechanisms.
    - Revision of sample set tolerances.
  - Created Supplement 14 to address coordinated ID qualification for DM, SS, and Fe.
  - Sample Requests for Relief are now at Rev. 2 due to Code Editorial changes and Supplement 14 tolerance changes – available on EPRIQ website.
- **Future activities**
  - Revise Supplement 11 to update WOR requirements.

RPV Related NRC Activities

- **Examination coverage requirements for circumferential scans of the outer 85% of nozzle-to-vessel welds**