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Date: Tue, May 11, 2004 1:07 PM
Subject: May 11 rev2.ppt

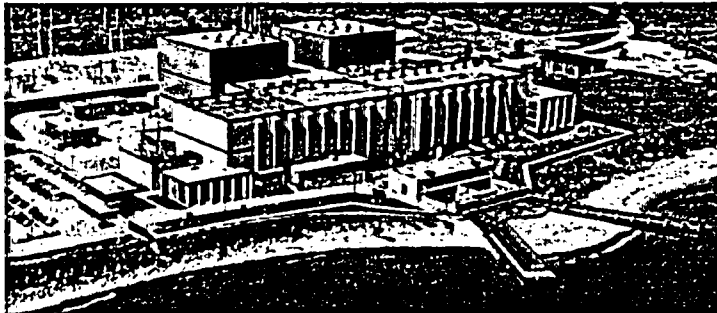
Harold,

Attached is the outline of the discussion we would like to have with the staff at 3 pm EDT today.

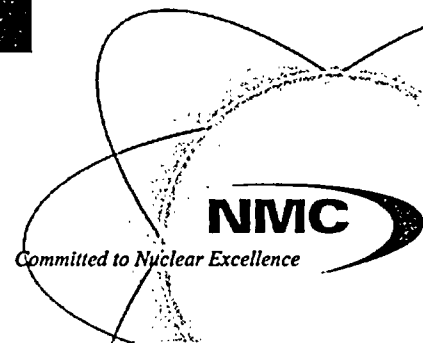
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B-10

Point Beach Nuclear Plant Unit 1 – Spring
2004 RPV Head Inspection Results



Conference Call
Tuesday May 11, 2004



Purpose

- Review RPV inspection results from the PBNP-1 refueling outage (U1R28)
 - Limitation in coverage of Nozzles 32 & 33
 - Relaxation of NRC Order EA-03-09 is requested

- Discuss Repairs being performed on Nozzle 26
 - Areva's ID Temperbead (IDTB) repair process
 - Revised relief requests required for this repair due to A52 to A82/182 weld overlap

PBNP-1 General RPV Design Information

- Westinghouse 2-loop design (132" ID)
- Alloy 182 J-groove welds
- Fabricated by B&W
- EDY 15.5 - high susceptibility category of NRC Order EA-03-09

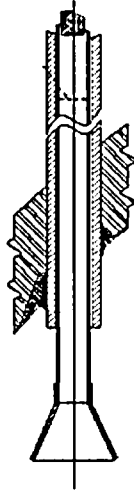


PBNP-1 Inspection History & Plans

- Eddy current exam performed in 1994
 - No indications (95% coverage)
- Bare-metal visual (BMV) exam performed in Fall 2002 (no indications)
- UT examination performed in Fall 2002 (no indications)
 - Greater than 90% coverage
- RPV head will be replaced during U1R29 (18 months - Fall 2005)

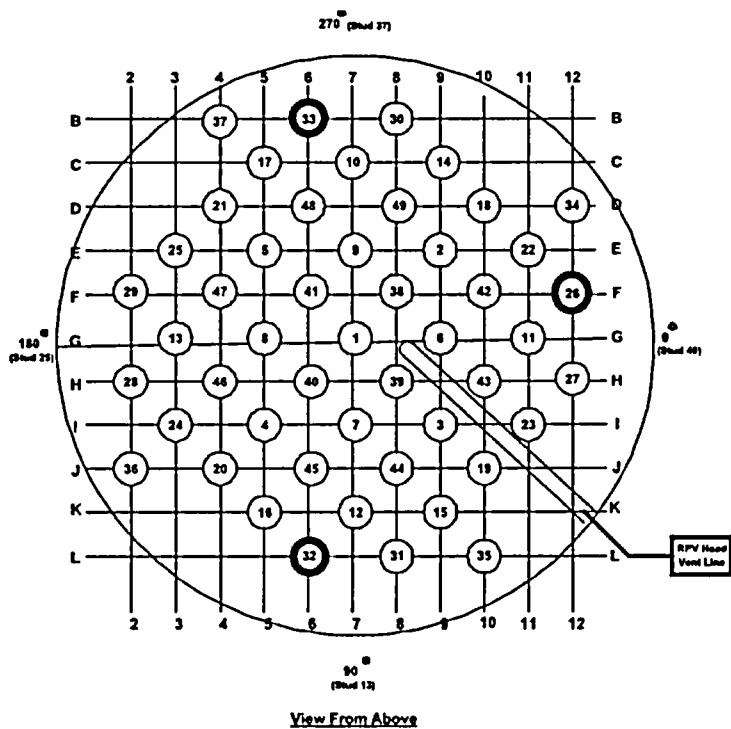


CRDM Penetration Configuration



- 49 CRDM Penetrations
 - 33 w/ thermal sleeves
 - 16 open housings
- 1 vent line

CRD Penetration Layout

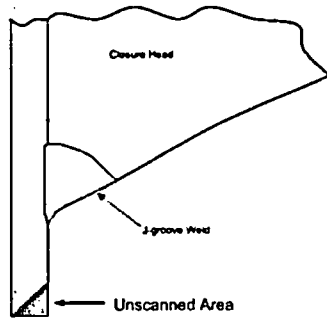


U1R28 Inspection Results

- BMV exam essentially complete w/ no indications
- Overall > 95% UT coverage
- Limitations
 - All thermal sleeved locations (33) have minor area of lack of OD coverage of 0.4" at bottom of tubes due to probe design
 - Nozzles 32 & 33 have inaccessible areas due to weld distortion
- Nozzle 26 Repair
 - UT and surface indications

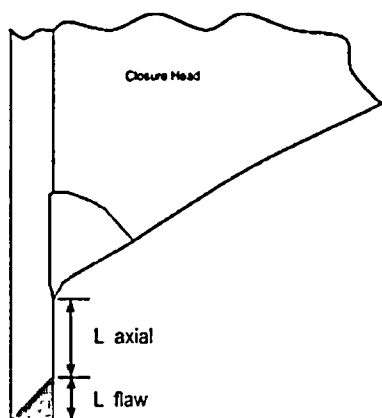


UT Limitations – Tube Bottom at OD



- Due to design of blade type UT probes, a small area on the bottom OD of tubes is unexamined
- Generic issue with the Areva blade tool

UT Limitations – Tube Bottom at OD



- Flaw assumed in the unexamined area (L flaw) and grows axially through the scanned area L axial (minimum is 0.41")

UT Limitations – Tube Bottom at OD (cont.)

- Using conservative PBNP crack growth rate data (2×10^{-5} in/yr) derived from MRP-55, this worst-case flaw will take over 2.3 years to reach the J-groove weld
- Relaxation to Order EA-03-09 will be requested



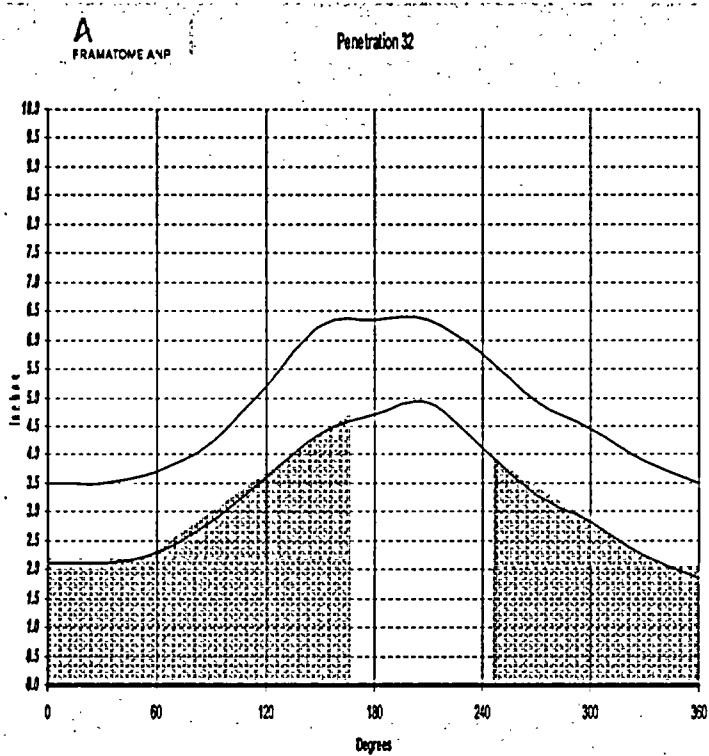
UT Limitations – Nozzles 32 & 33

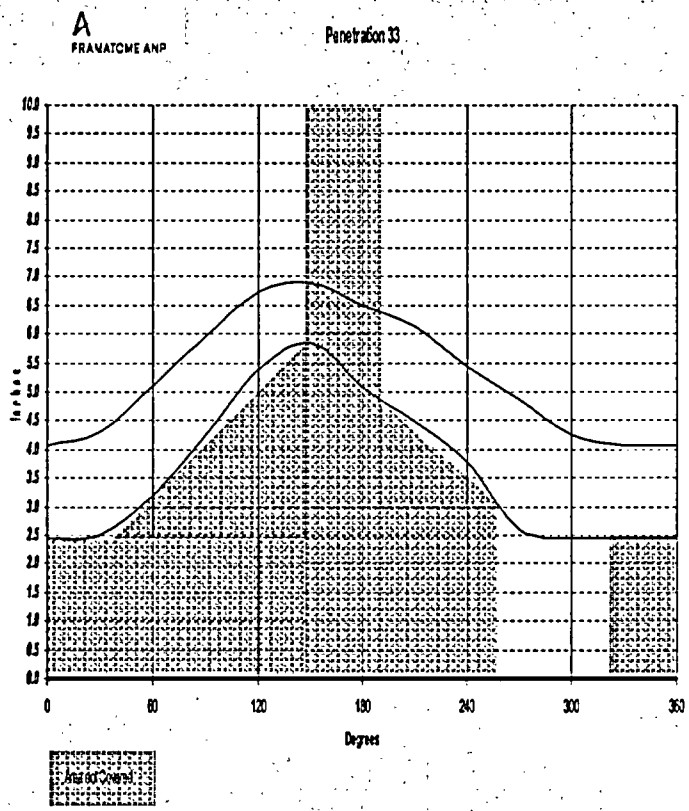
- Weld distortion limits blade-probe access
- Sleeves were removed in 2002 for full access (3 man-Rem per sleeve expended)
- No indications seen in 2002



UT Limitations – Nozzles 32 & 33

- 2004 Results (w/o sleeve removal)
 - Nozzle 32
 - 360° of coverage above and in the weld zone
 - 99° coverage below the weld
 - Nozzle 33
 - 300° of coverage above and in the weld area
 - 57° coverage below the weld
- Ability to remove and reattach thermal sleeve to support additional inspections is difficult





UT Limitations – Nozzles 32 & 33 (cont.)

- Circumferential flaw above the Nozzle 33 J-groove weld assessed
 - Initial flaw size of 60° (i.e., 300° of UT coverage)
 - Using WCAP-14000 and MRP-55 crack growth rate data, it would take an undetected flaw 30 years to grow to a allowable length (300°)



UT Limitations – Nozzles 32 & 33 (cont.)

- Thermal sleeve removal is very difficult for these nozzles due to the removal and welding process performed in 2002
- Relaxation from EA-03-09 will be sought for the limitation in coverage
 - Structural Integrity Associates (SIA - Riccardella) analysis supports minor limitations in coverage
 - This work was presented to NRR in February 2004 in preparation for the outage



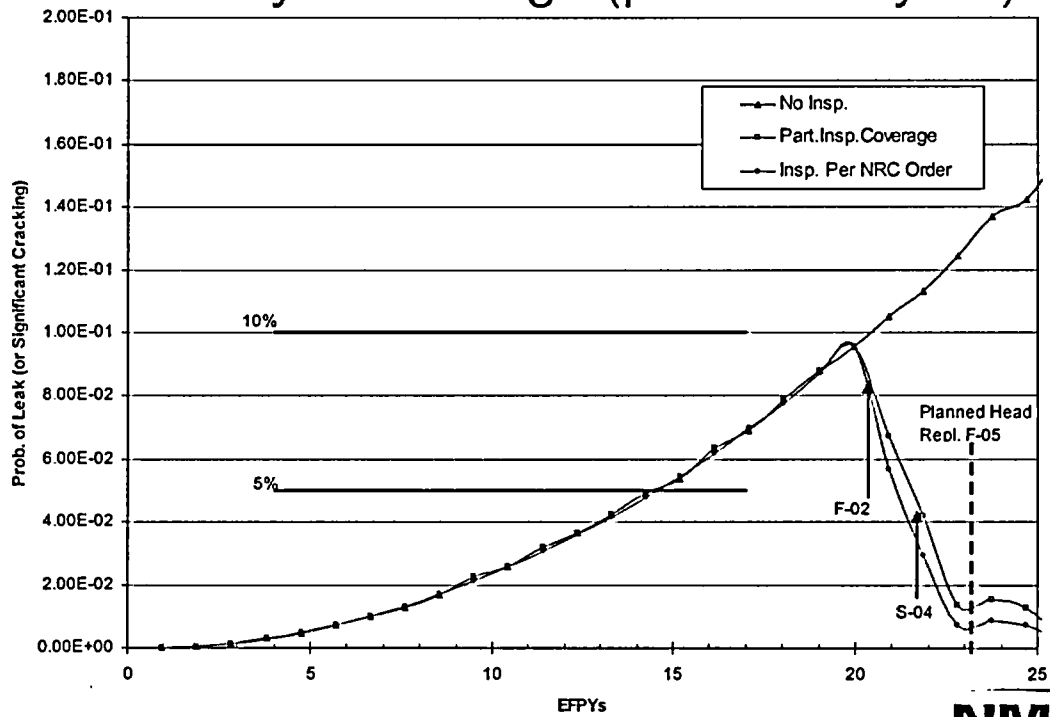
UT Limitations – Nozzles 32 & 33 (cont.)

- The SIA analysis assumed only 80% coverage during U1R28 (actual ~ 95%)
 - The SIA analysis assumed only 50% coverage in outer ring nozzles 26 - 33
- The results indicate an insignificant difference in the probability of leakage compared to that of full coverage
 - Differences do not warrant additional man-Rem required for thermal sleeve removal

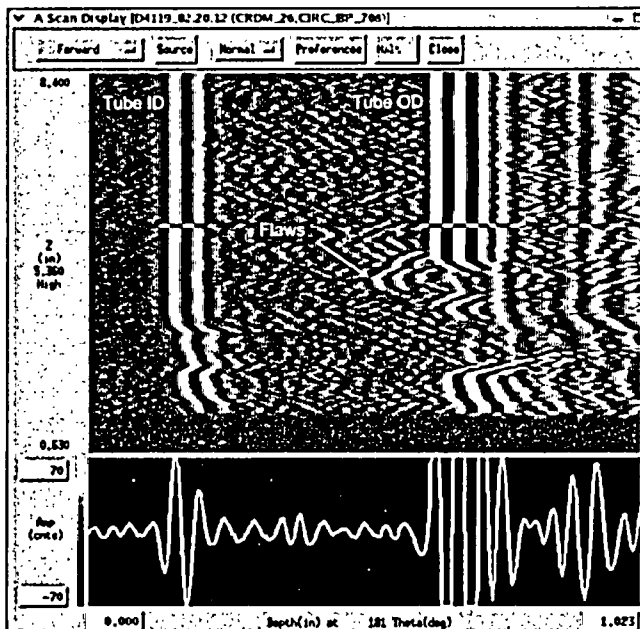


PBNP Results

Probability of Leakage (per vessel year)

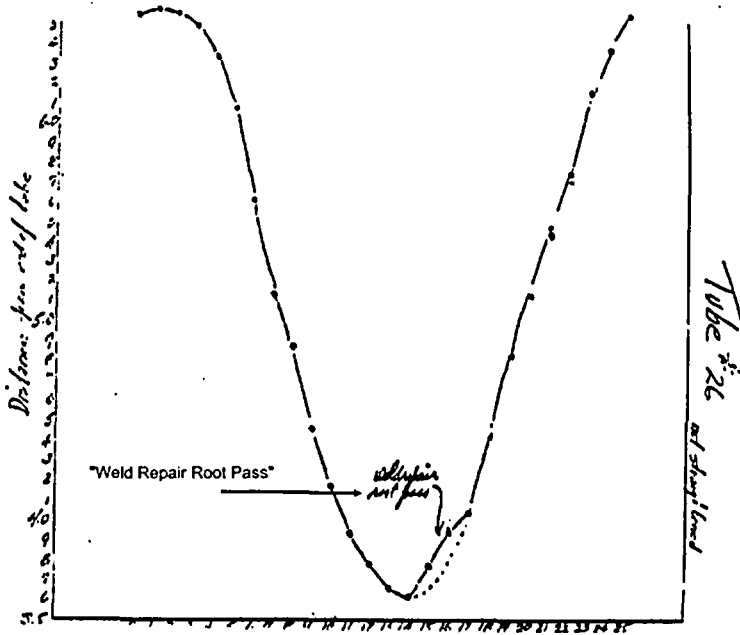


Nozzle 26 Indications



- Large UT signal detected at the weld root (downhill location - 180°)
- Signal attributed to a fabrication weld repair performed during construction

Nozzle 26 Indications (Cont.)



- weld repair performed at this location
- 1969 inspection report

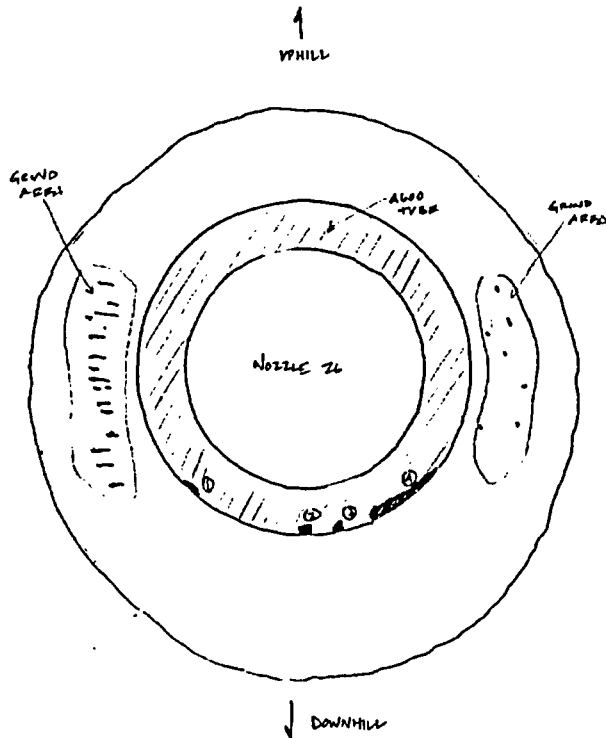


Nozzle 26 Indications (cont.)



- Several PTs revealed J-groove surface indications at the 90° and 270° locations (see following diagrams)
 - Based on grinding and subsequent PTs depth is > 3/16 inch
 - Conservative repair of nozzle being performed due to high dose involved with flaw excavation

Nozzle 26 Indications (Cont.)



- PT and UT signals superimposed
- Correlation between UT and PT signals
- Additional repair stresses

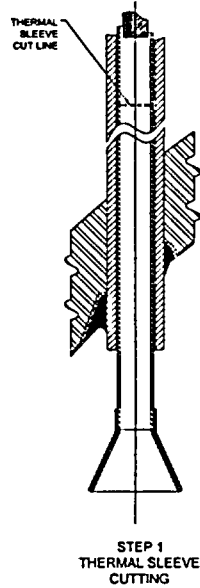
(illustrative diagram)

Nozzle 26 Repair

- Areva IDTB repair is in progress
- Complicated process due to smaller Westinghouse 2-loop RPV design
- Simplified repair process outline follows

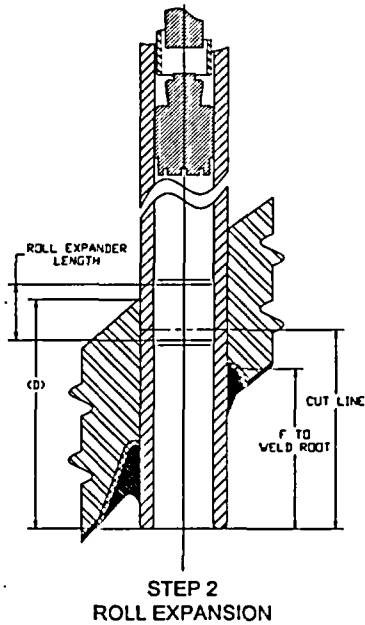


Step 1 – Thermal Sleeve Removal



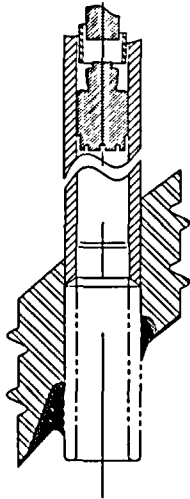
- Sever existing thermal sleeve

Step 2 - NDE & Roll Expansion



- Perform baseline rotating UT
- Using UT, take as-built measurements
- Roll expand nozzle

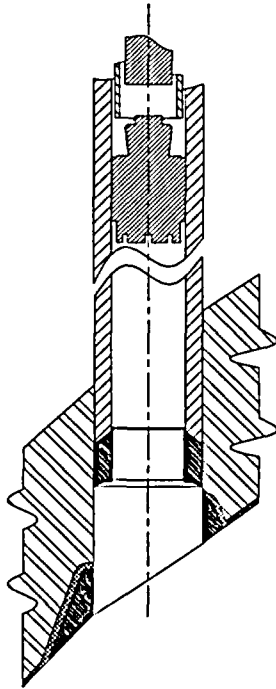
Step 3 – Machining of Nozzle



STEP 3
NOZZLE REMOVAL
AND WELD PREP
MACHINING

- Locate cut-line
- Machine the lower nozzle and form weld prep
- Etch the original J-groove weld to locate fusion line
- Size weld overlap
- PT and UT the original J-groove weld in the area of the overlap

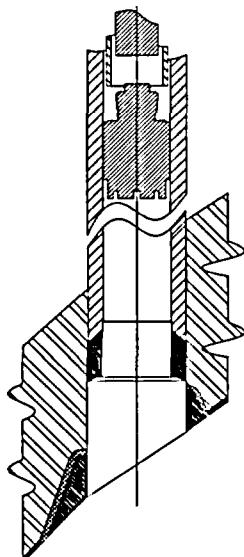
Step 4 – Welding



STEP 4
WELDING

- Perform IDTB Weld
- 48 hour Hold

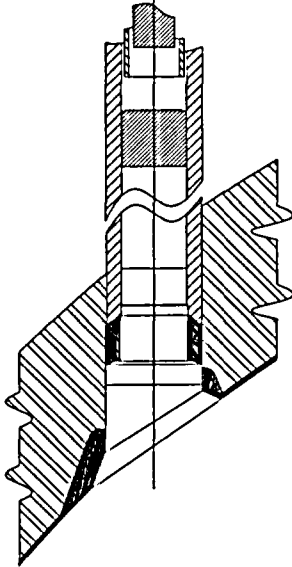
Step 5 –Machining of Weld & NDE



STEP 5
GRINDING, MACHINING,
AND NDE

- Machining of weld surface suitable for NDE during 48 hour
- Perform UT and PT of weld after the 48 hour hold

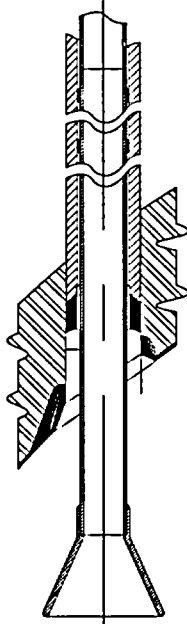
Step 6 – Chamfer Grinding



STEP 6
ORIGINAL
WELD GRINDING

- Grind chamfer on existing structural weld

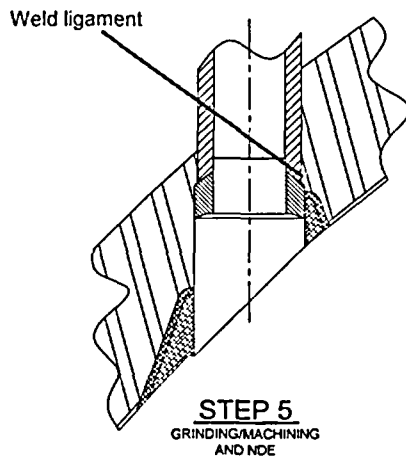
Step 7 – Thermal Sleeve Installation



STEP 7
THERMAL SLEEVE
REATTACHMENT

- Install and weld replacement thermal sleeve

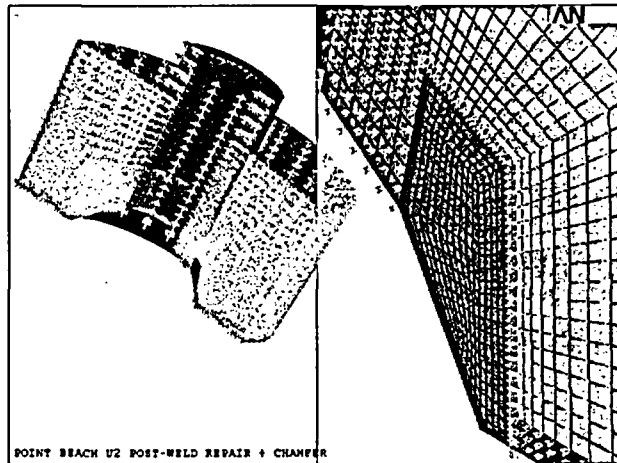
Nozzle 26 Weld Overlap Condition



- With small diameter (132") heads, the repair A52 weld will come into contact with the existing A182 J-groove weld
- Unique design challenge for the Westinghouse 2-loop plants

Nozzle 26 Weld Overlap Condition (cont.)

- NMC met with NRR on October 6th 2003 & February 19th 2004 to discuss this issue



Nozzle 26 Weld Overlap Condition (cont.)

- Crack growth rates (CGRs) in the Alloy 52 material are very low
- The analysis therefore conservatively assumed Alloy 600 CGRs (MRP-55)
- Analysis demonstrated that a worst-case flaw in the A82/182 would take in excess of 1.5 EFPY to go through the remaining Alloy 52 weld (0.26" weld ligament assumed)
- Separation via grinding was considered but determined to not be appropriate due to very high dose



Nozzle 26 Weld Overlap Condition (cont.)

- Actual weld ligament will be ~ 0.44 inches & the worst-case flaw would take over 2 years to pass through the A52 fusion zone
- Revised IDTB relief request will be processed using actual dimensions



Summary

- An NRC Order EA-03-09 relaxation request will be immediately submitted using actual coverage data
- A revised IDTB relief request will be submitted on Thursday May 13th using actual weld overlap data



Summary / Questions

