

2/15/02 S/G Conference Call Discussion Points

- 1) Discuss whether any primary-to-secondary leakage existed in this unit prior to shutdown.

No primary to secondary leakage was reported during the operating cycle.

- 2) Discuss the results of secondary-side hydrostatic tests.

None performed.

- 3) For each SG, provide a general description of areas examined, including the expansion criteria utilized and type of probe used in each area.

Bobbin: 100% full length testing (except Row 1 and 2 U-bend region), no expansion criteria since initial inspection is 100%.

+Pt: 100% hot leg top of tubesheet from 6" above to 3" below tubesheet. No expansion criteria for hot leg since initial inspection program is 100%. If a C-3 condition for the top of tubesheet is reported for the 2R09 outage, a 20% cold leg program will be included at 2R10.

+Pt: 100% examination of bobbin distorted signal indications at tube support plate intersections, 100% examination of bobbin freespan distorted signal indications, 100% bobbin mixed residual signals ≥ 1.5 volts, and $\leq 50^\circ$ phase.

+Pt: 100% examination of Row 1 and 2 small radius U-bends. Expansion criteria is 20% of Row 3 if an indication is reported in Row 2.

+Pt: 20% examination of hot leg Alloy 690 roll plugs.

+Pt: 20% examination of AVB wear locations to determine if ODSCC is hidden by wear scar signal.

+Pt: 20% examination of hot leg freespan dings $>5V$

- 4) For analyzed eddy current results, describe bobbin indications (those not examined with rotating pancake coil (RPC)) and RPC/Plus Point/Cecco indications. Include the following information in the discussion: location, number, degradation mode, disposition, and voltages/depths/lengths of significant indications.

Bobbin indications not examined by +Pt are applicable only to AVB wear and MBMs with no change from history.

Bobbin Inspections:

AVB Wear

- None $> 40\%TW$. Maximum AVB wear depth left in service is 35%. Number of AVB wear indications is essentially the same as 2R08.

Distorted Support Plate Indications

- 316 indications, slight increase over 2R08 results (279)
- Max voltage; 1.71 volts
- 4 confirmed DSIs – Characterized as TSP axial ODSCC

RPC Inspections:

Hot Leg TTS

- SG A: 6 tubes with OD circumferential degradation, 8 tubes with OD axial degradation, 1 tube with volumetric degradation (not crack-like, loose part wear)
- SG B: 3 tubes with OD circumferential degradation, 1 tubes with OD axial degradation, 1 tube with volumetric degradation (not crack-like, loose part wear)
- SG C: 2 tubes with OD circumferential degradation, 1 tube with ID axial degradation
- 20 tubes total for all 3 SGs with TTS ODSCC, 1 tube for all 3 SGs with TTS PWSCC
- Largest sludge pile axial ODSCC +Pt amplitude: 0.27 volts, maximum sludge pile axial ODSCC depth: 63%, maximum length: 0.25"
- Largest top of tubesheet circumferential ODSCC +Pt amplitude: 0.28 volts, maximum top of tubesheet circumferential ODSCC depth: 63%, maximum arc length: 116 degrees
- Single top of tubesheet axial PWSCC +Pt amplitude: 0.72 volts, maximum depth: 53%, length: 0.12"

Small Radius U-bends

- No degradation reported; mid-range +Pt inspection performed of all Row 1 and Row 2 tubes, high frequency +Pt performed for tubes with noise values exceeded predetermined limit (4 tubes)
- Three tubes preventively repaired due to probe restriction (difficulty also reported in 2R08)

Hot Leg Dents > 5 Volts, > 2 Volts but less than 5 Volts at 02H, 03H, and 04H (20% sample)

- No degradation reported

TSP Intersections

- All bobbin DSI signals +Pt inspected, 4 indications confirmed as axial ODSCC.
- All mixed residual bobbin signals with phase angles $\leq 50^\circ$, and ≥ 1.5 volts in all 3 SGs +Pt inspected. One confirmed indication as axial PWSCC.

Hot Leg Freespan Dings >5V (20% sample)

- One indication in SG A confirmed as axial ODSCC. Sample expanded to all HL dings >5V in SG A

- 5) Describe repair/plugging plans for the SG tubes that meet the repair/plugging criteria.

All crack-like indications at the top of tubesheet, TSP intersections, small radius U-bends, and freespan are repaired by plugging upon detection. While the voltage based repair criteria per GL 95-05 is licensed for Unit 2, the criteria has not been implemented.

- 6) Discuss the previous history of SG tube inspection results, including any "look backs" performed.

The dominant plugging contribution for Unit 2 has been ODSCC at the top of tubesheet region. Through the 2R08 inspection, a total of 49 tubes have been plugged for circumferential ODSCC, 50 for axial ODSCC, amongst all 3 SGs. Past history reviews have concluded that some percentage of reported indications at the top of tubesheet have precursor signals. Thus, ODSCC growth rates are low.

- 7) Discuss, in general, the new inspection findings.

For the first time, axial PWSCC was reported at the 2R09 outage.

A single indication was reported in SG C at the top of tubesheet. The indication was located within the geometry of the hardroll expansion transition. Shotpeening was applied to the hardroll expansion transitions of the BVPS Unit 2 SGs, prior to operation. This has successfully reduced axial PWSCC initiation potential. Other similar SGs that did not perform an ameliorative measure for this location have experienced significant axial PWSCC initiation.

Two indications suggestive of axial PWSCC were reported. The first was reported in SG B at the 05H TSP (4th TSP above flow distribution baffle). The second was reported in SG C at the 04H TSP. These indications were reported by bobbin and confirmed by +Pt. All similar bobbin indications in all SGs have been +Pt tested. No additional confirmed indications have been reported.

For the first time, ding ODSCC was reported at the 2R09 outage.

A single indication was reported in SG A in a 14 volt ding. The ding is located between the 02H and 03H TSPs. +Pt tested program is being expanded to all hot leg dings >5V.

- 8) Discuss your use or reliance on the X-probe, if applicable.

The X-probe is not being used at the 2R09 outage.

- 9) Describe in-situ pressure test plans and results, if applicable and available, including tube selection criteria.

Indications that exceed screening criteria will be in situ pressure tested. The EPRI in situ pressure testing guidelines are used for screening indications. To date, no indications have exceeded the screening criteria.

- 10) Describe tube pull plans and preliminary results, if applicable and available; include tube selection criteria.

No tubes are scheduled to be pulled.

- 11) Discuss the assessment of tube integrity for the previous operating cycle.

Tube integrity assessment for the previous cycle followed a methodology consistent with the EPRI tube integrity guideline. No indications were judged to represent a leakage

condition at SLB; no indications were judged to represent a challenge to structural integrity performance criteria.

12) Discuss the assessment of tube integrity for the next operating cycle.

Assessment of tube integrity for the next operating cycle will follow a methodology consistent with the EPRI tube integrity guideline.

13) Provide the schedule for SG-related activities during the remainder of the current outage.

Eddy current testing and evaluation is scheduled to be completed on 2/14/02.

14) Discuss what steps have been taken, or will be taken, in response to lessons learned from the Indian Point Unit 2 tube failure. In addition, please be prepared to discuss the following:

- a) Discuss the actions that are taken in response to identifying a new degradation mechanism, and
 - b) Discuss the actions taken to ensure that data noise levels are acceptable, and
 - c) Address data quality issues and the need for criteria to address data quality.
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- a) Identification of new degradation mechanisms will utilize available inspection techniques to adequately characterize the degradation. If necessary, in situ pressure testing will be performed to establish tube structural and leakage integrity. New degradation mechanism tracked via Station Corrective Action Program.
 - b) Tube noise levels were evaluated prior to the outage using the 2R08 eddy current data. Tube noise levels were evaluated using the Westinghouse guideline, which compares plant noise levels against noise levels of tubes in the EPRI ETSS database, as well as a theoretical comparison of plant noise levels against flaw amplitudes that represent maximum degradation depths that could be left in service and still satisfy tube integrity at the end of the next operating cycle. Noise measurements are being recorded for each small radius U-bend test using the mid-range +Pt coil. Those tubes exhibiting noise values exceeded a previously established limit are tested with a high frequency +Pt coil.
 - c) Data quality during the outage is monitored on line. A qualified data analyst, referred to as the "data cop", monitors data quality during the acquisition phase. Data judged to be noisy is rejected at this point.