

Salem Unit 2 R14 Responses to NRC SG Tube Inspection Discussion Points

1. During Cycle 14, primary to secondary leakage was less than 1 gpd. However, a few Steam Generator Gross Activity measurements were not below detection limits. In addition, gamma activity was detected on condensate polisher anion resin samples that were checked for radioactivity prior to shipment to a laboratory for resin condition evaluation. These are possible indications of a miniscule quantity of RCS escaping to the Secondary Cycle.
2. No secondary side pressure tests have been performed during 2R14.
3. No new deviations have been taken to the EPRI Industry Guidelines during RFO14. The following is a list of the deviations taken during previous inspections that are being taken again during 2R14:
 - Level III SSPD Exemption
 - Analyst Performance Monitoring
 - Calibration Standard Flaws
 - Transfer Standard Voltage
 - Process Control Requirements

The technical justification for all of these exceptions has been document as required in Appendix D of NEI 97-06. Equivalencies have also been performed and documented to ensure that the techniques utilized in 2R14 are not adversely affected.

4. See the Table below, "Summary of 2R14 SG Base Scope Tube Inspection Plans", for a summary of the inspections performed during outage 2R14. Expansions are in accordance with the EPRI PWR Examination Guidelines Rev 6.
5. See the Table below, "Salem 2R14 Summary of Tube Degradation", which provides degradation detected to date. Information related to the severity of the indications is also provided. Performance criteria were met at EOC 14 for all degradation detected to date. No new or unexpected degradation detected at this time.
6. All tubes with crack-like indications and those exhibiting greater than or equal to 40%TW cold leg thinning or AVB wear will be repaired by plugging.
7. No tube pulls or in-situ testing is planned at this time.
8. SG eddy current estimated to be completed by 4/22/2005 – 4/23/2005, followed by tube plugging. SG manway installation is targeted for approximately 4/24/2005.

9. Loose Parts:

- a. During the ECT inspections, the bobbin coil data is screened for PLPs (possible loose parts) and tube degradation. Additionally, the rotating coil (+Point) data is reviewed for PLPs or wear associated with PLPs.

In addition to the eddy current inspections, secondary side visual inspections were also performed in all four steam generators. These inspections were performed after sludge lancing and included top of tubesheet inspections of the annulus and the divider lane and included a minimum of five inner bundle passes. The visual inspections also include all locations of eddy current PLPs at the top of the tubesheet.

- b. A large portion of the loose parts detected were metal curls or turnings. This is especially true at the top of the hot leg tubesheet in SG24. These curls range up to about 2 inches long, however are predominantly in the range of approximately ½ inch. Metal rods up to about ¼" diameter and about 2" long were detected. A few pieces of wire were also detected. Some parts were located in the inner bundle at the top of the tubesheet. Most of the parts, however, were located in the annulus region at the top of the tubesheet.
- c. Several foreign objects have been removed from the Salem Unit 2 SGs, work efforts are still in progress.
- d. No eddy current indications of wear from foreign objects detected at the time of this letter.
- e. The feedwater system maintenance activities from previous outage(s) are suspect for the source of the foreign objects.

Summary of 2R14 SG Base Scope Tube Inspection Plans

	Area	Probe	Inspection
1	Full Length (Tube end to tube end)	Bobbin	100% of all in-service tubes in each steam generator with exception of tubes inspected in U-bends with RC Probe (see DA)
2	U-Bends (07H to 07C)	+Point™	100% of all in-service U-bend tubes in Rows 2 through 10, and 20% of Rows 13 through 17 in each steam generator
3	WEXTEx TTS	+Point™	100% of all in-service tubes in the HL in each steam generator Extent is +3" above TTS and -8" below TTS
4	Tubesheet Anomalies	+Point™	Inspect all 2R13 historical tubesheet anomalies (HL & CL)
5	PWSCC for Dented TSP Intersections (⇒ 1 V)	+Point™	100% of the ⇒ 1 volt dented TSP locations at 01H, 02H, 03H and 20% sample of 04H in each SG. 100% of the ⇒ 1 volt dented AVB locations in the U-bend
6	ODSCC for Dented TSP Intersections (> 5 V)	+Point™	25% of the > 5 volt dented TSP locations at 04H to 07H, in each SG.
7	Suspected TSP Ligament Cracking (SLC)	Bobbin and +Point™	100% +Point of all previously identified SLC
8	Free Spun Bobbin Indications (Dings)	+Point™	25% inspection of the ⇒2 volt HL dings in each SG from TSH +0.5" to 07H + 2.0" 100% inspection of the ⇒2 volt dings in each SG within the U-bend region (07H to 07C)
9	Tube Plugs	Visual and +Point™	Visual inspection of 100% of the installed tube plugs in each steam generator. +Point inspection of 4 tube plugs (SG 21 R2 C45 and SG 24 R2 C3), HL and CL as discussed in the DA
10	Special Interest Base Scope	Visual and Bobbin and/or +Point	SSI and NDE Level III review of ECT data 1AW DA (sections 7.1.2 and 7.6): SG 21 R2 C45 SG 24 R2 C3 SG 24 R15 C92

SALEM UNIT 2 R14

Preliminary Repairable Indication and Tube Status Report

Location	Tube Degradation	Steam Generator				Total
		2-1	2-2	2-3	2-4	
TSP	Axial PWSCC	1	1		2	34
	Axial ID/Axial OD					
	Circ PWSCC					
	Circ ODSCC	1				1
	Axial ODSCC <i>PWSCC</i>	1				1
	Mixed Mode Axial OD/Circ					
	Mixed Mode Axial ID/Circ	1				1
Tubesheet	Axial PWSCC in W* Length	10	5		21	36
	Axial ODSCC @ TTS	1	2		2	5
	Circ PWSCC @ TTS					
	Circ ODSCC @ TTS	2				2
	Volumetric OD @ TTS				2	2
U-bends	Axial PWSCC (Inds)					
	Axial ODSCC (Inds)					
	Circ PWSCC (Inds)					
	Innermost/Outermost Rows with Degradation					
High Row U-bends	AVB Wear $\geq 40\%$	2		1		3
Cold Leg Thinning	Thinning $\geq 40\%$		1		5	6
Free Span	Confirmed Indications					
Misc.	Preventative					
Total	Pluggable Indications	18	9	1	32	60
Total	Tubes to Plug	17	9	1	30	57

This table shows the number of indications with each type of degradation (not the number of tubes).

Status: As of 4/20/2005, 12 pm.

Salem 14RFO 2005
Axial Indications

SG	Row	Tube	Ind	Volts	TSP	Inch	Probe	Depth %TW (max.)	Ax Len	Deg. Mode
24	20	22	SAI	0.73	TSH	-0.2	720PP	24	0.05	WEXTEx PWSCC
24	39	22	MAI	0.64/0.40	TSH	-0.16/-0.28	720PP	46/56	0.16/0.12	WEXTEx PWSCC
24	6	42	SAI	0.51	TSH	-0.09	720PP	40	0.06	WEXTEx PWSCC
24	7	27	SAI	0.43	TSH	-0.28	720PP	28	0.1	WEXTEx PWSCC
24	32	58	SAI	0.43	TSH	-1.4	720PP	41	0.09	WEXTEx PWSCC
24	8	2	SAI	0.81	01H	-0.02	720PP	40	0.23	TSP PWSCC
24	10	39	SAI	0.3	01H	-0.14	720PP	40	0.08	TSP ODSCC
22	3	70	SAI	0.3	01H	-0.26	720PP	19	0.05	TSP PWSCC

Circumferential Indications

SG	Row	Tube	Ind	Volts	TSP	Inch	Probe	Depth %TW (max.)	Arc Len	Deg. Mode
21	13	29	MCI	0.1/0.15	TSH	0/-0.01	720PP	13 / 1	23 / 41 deg	ODSCC
21	14	29	SCI	0.12	TSH	-0.07	720PP	11	74 deg	ODSCC
21	37	57	SCI	0.12	03H	0.08	720PP	19	31 deg	ODSCC

Circ/Axial Indication at Same Location

SG	Row	Tube	Ind	Volts	TSP	Inch	Probe	Depth %TW (max.)	Arc Len	Deg. Mode
21	6	2	SCI	0.63	01H	0.25	720PP	62	38 deg	PWSCC
			SAI	0.35	01H	0	720PP	51	0.14	PWSCC

Repairable Bobbin Calls By Depth

SG	Row	Tube	%TW	Volts	TSP	Inch	Probe	Deg. Mech
22	43	60	54	0.45	02C	0	720ULC	CLT
24	43	34	47	0.71	03C	0.05	720ULC	CLT
24	43	34	45	1.12	02C	0.05	720ULC	CLT
21	23	68	43	3.32	AV2	-0.45	720ULC	AVB Wear
24	30	83	42	1.51	01C	-0.09	720ULC	CLT
24	43	59	42	1.53	01C	-0.04	720ULC	CLT
24	33	78	41	2.23	02C	0.16	720ULC	CLT
21	36	52	40	3.12	AV2	-0.53	720ULC	AVB Wear
23	40	54	40	2.76	AV1	0.52	720ULC	AVB Wear

Preliminary Status: As of 4/20/2005. 12 pm.