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Vogtle Electric Generating Plant, Unit 1
Refueling Outage 1R23 Steam Generator Tube Inspection Report

Ladies and Gentlemen:

In accordance with the requirements of Vogtle Electric Generating Plant (VEGP) Technical Specification 5.6.10 as updated by TS Amendment 211 (Adams Accession No. ML21316A055), Southern Nuclear Operating Company (SNC) submits the enclosed Steam Generator (SG) Tube Inspection Report for the SG tube inspection performed during the twenty-third refueling outage on Unit 1 (1R23) as an Enclosure to this letter.

This letter contains no NRC commitments. If you have any questions, please contact Ryan Joyce at 205.992.6468.

Respectfully submitted,



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CAG/dsp/cbg

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cc: Regional Administrator
NRR Project Manager – Vogtle 1 & 2
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RType: CVC7000

**Vogtle Electric Generating Plant, Unit 1
Refueling Outage 1R23 Steam Generator Tube Inspection Report**

**Enclosure
1R23 Steam Generator Tube Inspection Report**

Introduction

The Vogtle Electric Generating Plant (VEGP) Unit 1 is a 4-loop Westinghouse plant with Westinghouse Model F steam generators with Inconel 600 thermally treated tubing. Vogtle Unit 1 refueling outage 23 (1R23) was conducted after Steam Generator (SG) service equivalent to 1.44 effective full power years (EFPY) from previous SG eddy current inspections. During this operational interval, no tube leakage was reported. Analysis based on conservative assumptions used in the Condition Monitoring (CM) and Operational Assessments (OA) demonstrated that there were no tubes that exceeded the Reg. Guide 1.121 or NEI 97-06 Revision 3 criteria for tube integrity during Cycle 23.

During VEGP 1R23, a total of eleven (11) tubes were plugged. None of the indications exceeded the condition monitoring limits identified in the Degradation Assessment and therefore did not require in-situ pressure testing. Permanent H* Alternate Repair Criteria (ARC) has been approved for implementation by the NRC. Therefore, SNC and Westinghouse omitted tube end +Point™ inspections below top of tubesheet (TTS) -15.2 inches. TTS inspections ranged from TTS +3 inches to TTS -15.2 inches. The scope and results of inspections on each SG are described below.

A. Technical Specification 5.6.10.a, the scope of inspections performed on each SG,

- 100% bobbin examination of tubes in SG2 and SG3, full length except for Rows 1 and 2, which are inspected from tube end to the top tube support plate (TSP) from both hot leg (HL) and cold leg (CL). This inspection included all previously detected indications of degradation. No bobbin inspections in SG-1 and SG-4.
- 50% +POINT probe examination of Row 1 and Row 2 U-bends from the top TSP on the HL side to the top TSP on the CL side in all SGs.
- +POINT probe examination of Special Interest of possible flaw locations identified by the bobbin probe including U-bends in both the HL and CL.
- 100% +POINT probe examination of HL tubes in all SGs from the TTS to the licensed ARC depth for H* (tube sheet HL side (TSH) +3/-15.2 inches). This inspection satisfied the required periodic sample that accompanies regulatory approval of H*.
- 100% +POINT probe examination of the HL and CL periphery and tubelane, excluding tubelane Columns 12 through 111, three tubes deep from TTS +3/-15.2 inches on the HL side and TTS +3/-3 inches on the CL side in all SGs.
- All secondary side foreign objects listed in the degradation assessment and any existing possible loose part (PLP) indications from the most recent inspection were 'boxed-in' by at least one tube. Any newly reported PLPs or foreign object wear indications were 'boxed-in' by at least two tubes with a +POINT probe.
- 100% +POINT of the HL tube bulge (BLG) and overexpansion (OXP) populations in all four SGs. This scope is captured as part of the HL tubesheet inspection scope. The BLG and OXP indications are defined as follows:
 - BLG = differential mix diameter discontinuity signal within the tubesheet of 18 volts or greater as measured by bobbin coil probe.

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- OXP = a tube diameter deviation within the tubesheet of 1.5 mils or greater as measured by bobbin coil profile analysis.
- 50% +POINT probe examination of dents and dings ≥ 2 volts in HL straight lengths and U-bends of all SGs. This sample was taken from the total number of dents and dings identified during previous inspections and any additional identified by the bobbin program.
- 25% +POINT probe examination of dents and dings >5 volts in CL straight length tubing in all SGs.
- 100% +POINT probe examination of all HL and CL TSP intersections, HL and CL TTS expansion transitions and all dents and dings of 2-sigma high stress tubes in all SGs.
- 100% visual inspection of all installed tube plugs from the primary side in all SGs.
- Visual inspection in all SGs of channel head primary side HL and CL inclusive of the entire divider plate to channel head weld and all visible clad surfaces. The known anomaly in the CL channel head of SG 1, previously dispositioned, has been evaluated for a change from the analyzed condition during this inspection, showing no discernable changes in shape or size. No other cladding anomalies were identified during 1R23 channel head visual inspections.
- Secondary side activities included:
 - Foreign object search and retrieval (FOSAR)
 - Sludge lancing
 - 7th support plate inspection in SG 1
 - Scale profiling

The X-PROBE was used during 1R23 outage to examine a sample of tubes with known indications or signals, i.e., Anti-vibration bar (AVB) and TSP wear, PLP, bulges, over expansions, dents, dings, and freespan indications. This included approximately 273 tubes in all four SGs. This was done to support future use of the array probe inspection technique which may be used in lieu of RPC/+POINT probe. The data was considered "information only".

No scope expansion was required for this inspection scope.

B. Technical Specification 5.6.10.b, the nondestructive examination techniques utilized for tubes with increased degradation susceptibility.

+POINT probe used at all HL and CL TSP intersections, HL and CL TTS expansion transitions and all dents and dings of 2-sigma high stress tubes in all SGs.

C. Technical Specification 5.6.10.c, for each degradation mechanism found:

- 1. The nondestructive examination techniques utilized,

Table 1: Degradation Found and Techniques

Degradation Mechanism Found	Technique Used
Mechanical wear due to foreign objects	Bobbin, +Point
Mechanical wear at AVB supports	Bobbin
Mechanical wear and wall loss from secondary side cleaning process	Bobbin, +Point
Mechanical wear at TSP	Bobbin
Outside diameter stress corrosion cracking (ODSCC) at the Hot Leg Expansion Transitions	+Point
Primary water stress corrosion cracking (PWSCC) at the Hot Leg Tubesheet Bulge and Overexpansion locations	+Point

- **2. The location, orientation (if linear), measured size (if available), and voltage response for each indication. For tube wear at support structures less than 20 percent through-wall, only the total number of indications needs to be reported,**

Mechanical wear due to foreign objects

Table 2: Vogtle 1R23 Foreign Object Wear Indications

SG	Row	Column	Location	%TW Depth	Voltage
1	1	2	BPH +16	12	0.12
1	24	66	3C+27	7	0.07
1	39	100	TSH+0.3	13	0.14
1	41	97	TSC+0.02	25	0.31
1	41	100	TSH+0.23	17	0.19
1	41	100	TSH+0.13	32	0.43
1	41	101	TSH+0.18	25	0.31
1	41	102	TSH+0.11	23	0.28
1	41	103	TSH+0.57	23	0.28
1	55	82	BPH+0.53	24	0.29
1	56	82	BPH+0.68	4	0.04
2	6	1	1C+1.41	7	0.07
2	53	48	TSC+0.40	9	0.09
2	54	46	TSC+0.12	16	0.18
3	29	111	BPH-0.26	9	0.32
3	30	111	BPH+0.88	32	0.44
3	53	84	TSC+10.73	13	0.15
4	38	104	BPH+0.18	13	0.14
4	40	57	6H+13.25	10	0.1
4	49	89	BPH+0.37	10	0.11

BPH - Baffle Plate on HL side
 TSH - Tubesheet region on HL side
 TSC - Tubesheet region on CL side

#C - Tube support plate # on CL side
 #H - Tube support plate # on HL side

Mechanical wear at AVB supports

In SG2, there are a total of 247 indications for AVB wear with 205 less than 20% Through-Wall (TW). In SG3, there are a total of 295 indications for AVB wear with 234 less than 20% TW. Table 3 and Table 4 include Vogtle 1R23 AVB wear indications greater than or equal to 20%TW.

Table 3: Vogtle 1R23 SG2 AVB Wear Indications \geq 20%TW

SG	Row	Column	Location	%TW Depth	Voltage
2	32	12	AV3	28	0.83
2	35	83	AV5	20	0.64
2	38	106	AV5	27	1.3
2	39	105	AV5	26	0.95
2	40	93	AV5	20	0.6
2	40	98	AV5	22	0.91
2	40	105	AV5	27	1
2	41	33	AV4	27	1.02
2	41	33	AV5	24	0.83
2	41	42	AV5	35	1.98
2	41	42	AV4	29	1.35
2	41	103	AV5	27	1.03
2	42	76	AV5	33	1.49
2	42	76	AV2	25	0.9
2	42	94	AV4	22	1.03
2	42	97	AV4	38	1.99
2	42	97	AV3	23	0.77
2	42	100	AV4	20	0.79
2	43	87	AV5	21	0.64
2	43	91	AV5	31	1.21
2	43	91	AV2	29	1.1
2	43	93	AV4	21	0.64
2	43	93	AV3	21	0.65

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SG	Row	Column	Location	%TW Depth	Voltage
2	46	49	AV3	22	0.8
2	46	50	AV3	34	1.65
2	46	50	AV2	34	1.71
2	46	50	AV4	30	1.3
2	46	50	AV5	26	1.03
2	46	50	AV1	25	0.92
2	46	58	AV2	28	1.07
2	48	98	AV6	20	0.79
2	49	89	AV5	24	0.8
2	49	89	AV4	23	0.72
2	50	84	AV4	35	1.77
2	50	84	AV3	30	1.28
2	50	89	AV4	35	1.6
2	52	91	AV2	21	0.61
2	53	79	AV3	22	0.58
2	54	84	AV5	32	1.49
2	54	84	AV3	23	0.81
2	54	84	AV4	21	0.69
2	55	84	AV5	22	0.75

Table 4: Vogtle 1R23 SG3 AVB Wear Indications $\geq 20\%$ TW

SG	Row	Column	Location	%TW Depth	Voltage
3	28	8	AV6	22	0.87
3	39	17	AV3	30	1.34
3	39	17	AV6	29	1.27
3	39	17	AV4	24	0.91
3	39	26	AV2	30	1.46
3	39	35	AV3	27	1.15
3	39	35	AV4	20	0.67
3	39	102	AV5	33	1.82
3	39	102	AV2	24	0.94
3	40	19	AV5	22	0.64
3	40	19	AV2	20	0.55
3	40	30	AV5	20	0.81
3	40	98	AV2	24	0.87
3	40	100	AV2	26	1.02
3	40	102	AV2	32	1.71
3	40	104	AV6	20	0.82
3	40	104	AV4	20	0.84
3	41	19	AV5	34	1.48
3	41	19	AV4	20	0.54
3	41	21	AV4	22	0.65
3	41	99	AV5	33	1.86
3	41	102	AV3	40	2.78
3	41	102	AV4	37	2.26
3	41	102	AV2	33	1.79
3	41	102	AV5	21	0.59
3	42	21	AV5	20	0.55
3	42	21	AV2	20	0.54

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SG	Row	Column	Location	%TW Depth	Voltage
3	42	23	AV4	32	1.35
3	42	27	AV5	24	1.07
3	42	35	AV4	31	1.44
3	42	35	AV5	23	0.78
3	42	43	AV2	22	0.75
3	42	43	AV5	20	0.67
3	42	50	AV4	33	1.93
3	42	50	AV2	27	1.15
3	42	58	AV3	20	0.69
3	42	63	AV4	23	0.97
3	42	66	AV4	20	0.64
3	44	26	AV2	29	1.34
3	45	40	AV3	26	1.08
3	45	40	AV5	21	0.71
3	45	46	AV2	34	1.86
3	45	46	AV3	32	1.68
3	45	46	AV4	22	0.82
3	45	48	AV3	27	1.2
3	45	49	AV3	28	1.29
3	45	49	AV2	25	0.99
3	45	61	AV5	23	0.9
3	45	64	AV3	27	1.21
3	45	67	AV4	25	1.03
3	45	67	AV3	21	0.78
3	45	69	AV5	20	0.8
3	45	82	AV3	24	1.35
3	45	82	AV4	20	1.05
3	47	38	AV4	35	2.17

SG	Row	Column	Location	%TW Depth	Voltage
3	47	45	AV4	25	1.04
3	47	96	AV4	34	1.92
3	49	34	AV4	33	1.9
3	49	92	AV5	20	0.67
3	49	96	AV6	31	1.56
3	53	84	AV4	31	2.15

AV# - Location of AVB intersection with the tube (there are up to 6)

Mechanical wear and wall loss from secondary side cleaning process

Table 5 lists tube locations and volumetric indications associated with the ultrasonic energy cleaning and pressure pulse cleaning secondary side cleaning processes. Based on these nondestructive examination (NDE) uncertainty levels and the results, it is apparent that there has been no measurable progression in the wall loss associated with these historical indications. Further, the mechanisms that caused this form of degradation are no longer applied and therefore no wear progression can occur.

Table 5: Vogtle 1R23 Tube Wall Loss from Secondary Cleaning Process

SG	Row	Col	Location	Indication	%TW Depth	Volts
1	1	83	TSH+18.18	PCT	10	0.11
1	1	87	TSH+19.58	PCT	37	0.54
1	58	70	BPH+0.42	PCT	24	0.3
2	1	70	TSC+11.39	PCT	3	0.03
2	1	70	TSC+9.74	PCT	8	0.08
2	1	70	TSC+8.48	PCT	6	0.06
2	1	78	TSC+9.36	PCT	8	0.08
2	1	78	TSC+8.1	PCT	4	0.04
2	1	82	TSC+8.71	PCT	3	0.03
2	16	6	BPC+0.63	PCT	12	0.12
2	16	7	BPC+0.58	PCT	29	0.38
2	1	91	BPC-0.38	PCT	DSS	-
2	10	101	BPH-0.19	PCT	NDD	-

DSS - Distorted Support Signal
 NDD - No degradation Detected
 PCT - Volumetric Indication
 BPH - Baffle Plate on the HL side
 BPC - Baffle Plate on the CL side

Mechanical Wear at TSP

There are two (2) indications of mechanical wear at TSP that are less than 20% TW.

ODSCC at the Hot Leg Expansion Transitions

During the 1R23 SG inspections, eight (8) circumferential ODSCC indications were reported at HL TTS expansion transitions. Table 6 includes the ODSCC indications.

Table 6: Vogtle 1R23 ODSCC at Tubesheet Expansion Transitions

SG	Row	Column	Volts	Deg	Location	Max Depth% TW	PDA (%)	Precursor Signal
2	15	59	0.10	74	TSH-0.21	35	4.93	Yes 1R22
4	16	56	0.38	97	TSH-0.09	51	8.39	Yes 1R21
4	19	29	0.19	118	TSH-0.24	20 ⁽¹⁾	4.55	NDD 1R22
4	29	99	0.32	131	TSH-0.27	21	6.11	NDD 1R22
4	32	90	0.28	67	TSH-0.06	61	5.49	Yes 1R21
4	42	73	0.22	91	TSH-0.07	52	12.7	Yes 1R21
4	49	62	0.36	73	TSH-0.14	80	29.49	Yes 1R22
4	50	54	0.29	81	TSH-0.05	62	10.54	Yes 1R22

PDA - Percent Degraded Area

(1) Max depth was measured at 8% TW from depth profiling, but a minimum depth of 20%TW is assigned in order to provide a slightly more conservative average depth and PDA results.

Table 7: Vogtle 1R23 PWSCC at Tube Bulge and Overexpansion Locations and Within Tubesheet

SG	Row	Column	Volts	Deg	Location	Max Depth% TW
4	14	82	0.40	20	TSH-5.59	60

*Lookback shows precursor signal at 1R22

- **3. A description of the condition monitoring assessment and results, including the margin to the tube integrity performance criteria and comparison with the margin predicted to exist at the inspection by the previous forward-looking tube integrity assessment**

For existing degradation mechanisms, a comparison of the previous OA projection was compared to the 1R23 inspection results. The following provides a discussion of each comparison.

During the 1R23 eddy current inspections no tube wear was reported that was associated with legacy foreign objects. One new volumetric indication that is believed to be foreign object wear was observed during 1R23 and was measured at 13% TW. This is well below the 68% TW condition monitoring limit.

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For AVB wear, the OA projection from this assessment predicted new AVB wear at a maximum depth of 25% TW. The largest new AVB wear depth reported during 1R23 was 17% TW. Therefore, the OA assumptions, inputs, and methodology for AVB wear projections remain valid and conservative.

The end of cycle (EOC)-22 OA projection for TSP wear was determined to be 27% TW (not including NDE measurement uncertainty). The largest TSP wear depth reported during 1R23 was 19% TW. The OA projection from this assessment predicted new TSP wear at a maximum depth of 18% TW. There were no new indications of TSP wear during 1R23. Therefore, the OA assumptions, inputs and methodology for TSP wear projections remain valid and conservative.

The EOC-23 simplified worst-case degraded tube Monte Carlo OA projection over 1-cycle for circumferential ODSCC at expansion transitions is a flaw with a maximum depth of 97.1% TW, a circumferential extent of 182 degrees (1.09 inch), and a PDA of 34.4%. Fully probabilistic analyses were also performed assuming up to five undetected flaws with OA durations of one and two cycles. The probability of burst and probability of leakage for the most limiting case for the 2-cycle OA duration were 1.21% and 2.54%, respectively. The projected burst pressures for 1- and 2-cycle OA durations were 6286 psi and 5474 psi, respectively. No leakage was projected for the 1-cycle projections, but 0.093 gpm was predicted for the 2-cycle OA duration. The largest circumferential ODSCC indication detected at expansion transitions during 1R23 (SG4 Row 49 Column 62) had a maximum depth of 80%, circumferential extent of 135 degrees, and a PDA of 29.5%. The burst and ligament tearing pressure of this flaw with material, burst relation and NDE uncertainties included at 0.95 probability and 50% confidence are 6392 psi and 9422 psi, respectively. This most limiting flaw detected during 1R23 was bound by the 1-cycle Monte Carlo and the 1- and 2-cycle fully probabilistic projections.

- **4. The number of tubes plugged during the inspection outage.**

Table 8 presents a summary list of all SG tubes plugged in 1R23.

Table 8: Vogtle 1R23 Plugging List

SG	Row	Column	Indication	Location	Plugging Basis	Stabilizer
2	15	59	MCI	TSH	Circ ODSCC	Yes - HL TTS
3	41	102	PCT	AV3	AVB Wear 40% TW	No-not accelerated wear
3	53	84	PCT	TSC	Preventative	No
4	14	82	SCI	TSH	Circ PWSCC	Yes- HL TTS
4	16	56	SCI	TSH	Circ ODSCC	Yes- HL TTS
4	19	29	SCI	TSH	Circ ODSCC	Yes- HL TTS
4	29	99	SCI	TSH	Circ ODSCC	Yes- HL TTS

SG	Row	Column	Indication	Location	Plugging Basis	Stabilizer
4	32	90	SCI	TSH	Circ ODSCC	Yes- HL TTS
4	42	73	SCI	TSH	Circ ODSCC	Yes- HL TTS
4	49	62	SCI	TSH	Circ ODSCC	Yes- HL TTS
4	50	54	SCI	TSH	Circ ODSCC	Yes- HL TTS

MCI - Multiple Circumferential Indications
 SCI - Single Circumferential Indications
 PCT - Percent Through-Wall

D. Technical Specification 5.6.10.d, analysis summary of the tube integrity conditions predicted to exist at the next scheduled inspection (the forward-looking tube integrity assessment) relative to the applicable performance criteria, including the analysis methodology, inputs, and results.

For the foreign objects known to be remaining in the SG secondary side following 1R23, the analysis performed establishes that at least two cycles of operating would accrue before the object with greatest potential for tube degradation could potentially exceed the plugging limit of 40% TW. There is no wear at locations associated with the foreign objects known to be located on the secondary side in all SGs (one tube with wear was preventatively plugged because visual confirmation could not be made that a foreign object was not present). Regarding new and existing foreign object wear indications, there has either been no observed growth, or no foreign object observed at these locations and no further growth is expected outside of NDE measurement uncertainties.

Based on application of conservative AVB wear growth rates, the condition of the Vogtle Unit 1 SG tubes has been analyzed with respect to continued operability of the SGs until the end of Cycle 26 for existing and assumed undetected flaws, without exceeding the performance criteria. The growth rates were determined by comparative analysis of AVB wear sites for all SGs. The growth values obtained were not large enough to present a likelihood that conditions exceeding the structural and leakage integrity limits would occur at 1R24. The depth cycle growth per effective full power year (EFPY) used was 4.0%TW. The maximum AVB wear indication existing at 1R23 is projected to be 44% TW at 1R24, which does not include NDE uncertainties. The maximum AVB wear indication assumed to be undetected at 1R20 in a tube not inspected until 1R24 is projected to be 44% TW at 1R24 (not including NDE uncertainties). All existing AVB wear projections satisfy the condition monitoring limit of 64% TW and all undetected AVB wear projections satisfy the structural limit of 77% TW.

Mechanical wear at TSP locations was detected in two tubes during 1R23. Based on application of conservative TSP wear growth rates, the condition of the Vogtle Unit 1 SG tubes has been analyzed with respect to continued operability of the SGs until the end of Cycle 26 for existing and assumed undetected flaws, without exceeding the performance criteria. The depth cycle growth per effective full power year (EFPY) used was 5.0%TW. The maximum TSP wear indication existing at 1R23 is projected to be 26.5% TW at 1R24, which does not include NDE uncertainties. The maximum TSP wear indication assumed to be undetected at 1R20 is projected to be 40% TW at 1R24 (not including NDE uncertainty). All existing TSP wear

projections satisfy the condition monitoring limit of 53% TW and all undetected TSP wear projections satisfy the structural limit of 69% TW.

There has been a recurrence of circumferential ODSCC in the hot leg expansion transitions. Circumferential PWSCC within the tubesheet was also detected at 1R23 in one tube. Axial ODSCC, axial PWSCC at expansion transitions, and axial PWSCC in low row U-bend regions have been detected in prior inspections but were not reported during the 1R23 SG inspection. A fully probabilistic OA analysis was performed for all of these existing degradation mechanisms for inspection intervals of 1 cycle and 2 cycles (with the exception of Axial PWSCC in small radius U-bends, which was 2- and 3-cycles). The results of these analyses concluded that all SG performance criteria for structural and leakage integrity will be satisfied until end of Cycle 25.

E. Technical Specification 5.6.10.e, Number and percentage of tubes plugged to date, and the effective plugging percentage in each.

Table 9: Total Plugged Tubes after Vogtle 1R23

SG	# Tubes	1R23 # Plugged	Total # Plugged	% Plugging
1	5,626	0	31	0.55%
2	5,626	1	31	0.55%
3	5,626	2	42	0.75%
4	5,626	8	90	1.60%
Total	22,504	11	194	0.86%

F. Technical Specification 5.6.10.f, The results of any SG secondary side inspections.

FOSAR inspections were performed at 1R23. A total of 50 objects were found during FOSAR and 15 were retrieved. Five (5) objects require further evaluation to ensure tube integrity for upcoming cycle(s). For the objects remaining in the SG secondary side following Vogtle 1R23, the analysis performed establishes that continued steam generator operation with the foreign objects known to be present in the secondary side will not adversely affect the steam generator tube integrity for at least two full operating cycles. Sludge lancing was performed and a total of 59.5 lbs. of deposits were removed. Tube Support Plate 7 (TSP 7) Inspections in SG 1 were also performed in pre-defined columns. TSP 7 was found to be in acceptable condition, with the support plate and quatrefoils free of deposit. Only a moderate amount of tube scale was observed at TSP 7.

G. Technical Specification 5.6.10.g, The primary to secondary LEAKAGE rate observed in each SG (if it is not practical to assign the LEAKAGE to an individual SG, the entire primary to secondary LEAKAGE should be conservatively assumed to be from one SG) during the cycle preceding the inspection which is the subject of the report.

- No primary to secondary leakage was reported during this operating interval.

H. Technical Specification 5.6.10.h, The calculated accident induced leakage rate from the portion of the tubes below 15.2 inches from the top of the tubesheet for the most limiting accident in the most limiting SG. In addition, if the calculated accident induced

leakage rate from the most limiting accident is less than 2.48 times the maximum operational primary to secondary leakage rate, the report should describe how it was determined.

- The total predicted leakage at the lower 5th percent probability is 0.00 gallons per minute at room temperature (gpmRT) and 0.15 gpmRT following 1-cycle and 2-cycles of operation. H* implementation requires that the predicted leak rate is subtracted from the accident induced leakage limit (i.e., 0.35 gpmRT) and the result is divided by the H* leak rate factor of 2.48 to determine the amount of leakage that is allowed to leak from below the H* region of the tubesheet during normal operation. Following this method, the amount of leakage below H* that is allowed is 157 gpdRT, which is larger than the technical specification leak rate limit. Therefore, no administrative limit on operational leakage is required for Cycle 24 or Cycle 25.

I. Technical Specification 5.6.10.i, The results of monitoring for tube axial displacement (slippage). If slippage is discovered, the implications of the discovery and corrective action shall be provided.

- During 1R23, as part of the tube inspection program, 100% of the tubes in SG2 and SG3 were tested with the bobbin probe. The bobbin data collected was screened for large amplitude tubesheet indications of greater than 50 volts with a phase angle between 25° and 50° suggestive of tube severance. Both manual and automated data screenings have been performed with SVR as the code to report should a sever-type signal be detected. No SVR call was made for the entirety of the bobbin data collected therefore, no indications of slippage were identified.