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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555-0001

**Vogtle Electric Generating Plant – Unit 2
Fourteenth Maintenance/Refueling Outage
Steam Generator Tube Inspection Report**

Ladies and Gentlemen:

In accordance with the requirements of Vogtle Electric Generating Plant Technical Specification 5.6.10, Southern Nuclear Operating Company submits this report of the steam generator tube inspections performed during the Unit 1 Fourteenth maintenance/refueling outage (2R14). Entry into Mode 4 occurred on April 2, 2010.

This letter contains no NRC commitments. If you have any questions, please contact Jack Stringfellow at (205) 992-7037.

Respectfully submitted,

M. J. Ajluni
Nuclear Licensing Director

A handwritten signature in black ink that reads "Mark J. Ajluni". The signature is written in a cursive, flowing style.

MJA/TAH/lac

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**Vogtle Electric Generating Plant – Unit 2
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Enclosure

2R14 Steam Generator Tube Inspection Report

2R14 STEAM GENERATOR TUBE INSPECTION REPORT

Introduction

The 2R14 outage was conducted after cumulative service equivalent to ~ 18.5 EFPY (effective full power years); the Cycle 14 power generation was ~1.33 EFPY. Analyses based on conservative assumptions used in the Condition Monitoring and Operational Assessments demonstrated that there were no tubes that exceeded the Reg. Guide 1.121 and NEI-97-06 Revision 2 criteria for tube integrity during Cycle 14. The eddy current inspections were performed by the Steam Generator Maintenance Services Group of the Westinghouse Nuclear Services Division. Secondary data analysis was performed by NDE Technology under direct contract with Southern Nuclear. Two tubes (R40C58 and R52C73) in SG2 were plugged due to anti-vibration bar (AVB) wear that exceeded the Technical Specifications (TS) plugging criteria. No tubes required In-Situ pressure testing. The H* Alternate Repair Criteria was approved for Cycle 15 operation; therefore, tube end +Point inspections below top of tubesheet (TTS) -13.1" were omitted for 2R14 and the TTS inspection samples ranged from TTS +3" to TTS -13.1".

2R14 Scope

The scope for 2R14 consisted of the inspections listed below. The inspection program, in accordance with Revision 7 of the EPRI PWR SG Examination Guidelines, addressed the known degradation mechanisms observed in Vogtle Unit 2 in prior inspections, as well as those regarded as potential degradation mechanisms.

- 100% Bobbin examination of tubes in SGs 2 and 3, except for Rows 1 and 2, which are inspected from tube end to TSP#7 from both HL and CL.
- 50% +Point examination of small radius U-bends (Row 1 and Row 2) in SGs 2 and 3, including all Row 1 and Row 2 tubes that were not +Point inspected in the U-bend during 2R12.
- +Point examination of Special Interest, HL and CL, of bobbin possible flaw locations including U-bends.
- Tubes indicating Seabrook-type U-bend offset behavior, with DSIs (TSP indications) that are not confirmed, will nonetheless be preventively plugged.
- 50% +Point examination of expanded tubesheet section BLGs and OXPs in the region TSH +3 inches to the H* depth of TSH -13.1 inches. The sampled extents in SG2 and SG3 for this inspection program include all BLG and OXP locations in this elevation range which were not tested during the 2R12 outage. These tubes are included in the 50% H* length +Point program.
 - BLG = differential mix diameter discontinuity signal within the tubesheet of 18 volts or greater as measured by bobbin coil probe;
 - OXP = a tube diameter deviation within the tubesheet of 1.5 mils or greater as measured by bobbin coil profile analysis.
- 50% +Point examination at HL tubes from TSH +3" down to the licensed H* depth at TSH -13.1 inches.
- +Point examination of 100% of dents and dings ≥ 2 volts in HL straight lengths of SG2 and SG3, with the total number of inspected dents and dings to comprise no less than 25% of the total dents and dings ≥ 2 volts in Vogtle Unit 2 SGs, and with any makeup which is required to meet the 25% quantity being selected from U-bends.
- Visual inspection of tube plugs in SGs 2 and 3.
- Slippage monitoring in accordance with regulatory requirements for the licensing of H*.

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Degradation Mechanisms Found and NDE Techniques Utilized

Wear at AVBs is the only continuing degradation mechanism in the Vogtle 2 SGs. The bobbin probe, which is qualified for detection and sizing of AVB wear by ETSS 96004.1 Revision 12, was used to evaluate this degradation.

Service Induced Indication Descriptions

Volumetric

The following Volumetric Indication was seen during 2R14:

Vogtle 2 Volumetric Indication for 2R14

SG	Row	Col	Volts	%TWD	Locn
3	1	112	0.28	21	¹ TSC+18.2"

¹TSC – Tubesheet region on CL side.

The indication in SG3 R1C112 was determined to be a historical indication that originated from interaction with sludge lance equipment prior to 2004 (2R10). No PLP indication was associated with this location.

AVB Wear

AVB wear continued to be identified in Vogtle 2R14 in SG2 and SG3. Tube locations where AVB wear was identified are provided in the tables below for each SG:

Vogtle 2R14: SG2 AVB Wear Indications

Row	Col	Location ¹	2R14 %TWD	Row	Col	Location ¹	2R14 %TWD
29	10	AV5	10	52	73	AV2	13
34	12	AV3	6	52	73	AV3	33
36	14	AV4	8	52	73	AV4	46
38	15	AV2	10	52	73	AV5	29
38	15	AV3	13	52	73	AV6	32
36	16	AV6	10	38	74	AV2	12
42	19	AV2	12	38	74	AV3	14
42	19	AV3	14	38	74	AV4	13
42	19	AV4	14	38	74	AV5	8
42	19	AV5	14	38	74	AV6	7
43	20	AV1	8	42	74	AV2	27
43	20	AV2	13	42	74	AV3	24
49	32	AV4	12	42	74	AV4	9
38	39	AV2	9	42	74	AV5	7
38	39	AV3	14	42	74	AV6	10
38	39	AV4	13	49	74	AV3	19
38	39	AV5	20	51	74	AV3	18
56	41	AV3	13	51	74	AV4	10
39	43	AV2	21	51	74	AV5	8
39	43	AV3	19	51	74	AV6	7
39	43	AV4	14	57	79	AV3	9
39	43	AV5	14	57	79	AV4	12
39	43	AV6	10	38	81	AV2	11
56	43	AV6	13	38	81	AV5	12
39	44	AV3	16	38	81	AV6	15
39	44	AV5	10	56	82	AV5	11

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¹ AV# - Location of AVB intersection with the tube (up to 6)

Vogtle 2R14: SG2 AVB Wear Indications (continued)

Row	Col	Location ¹	2R14 % TWD	Row	Col	Location ¹	2R14 % TWD
39	44	AV6	9	55	84	AV1	10
38	45	AV1	11	55	84	AV4	11
40	48	AV4	20	54	86	AV4	10
40	48	AV5	11	51	87	AV2	29
45	49	AV3	13	51	87	AV3	29
57	49	AV6	12	51	87	AV4	23
42	50	AV2	16	51	87	AV5	31
42	50	AV3	11	39	88	AV4	11
42	50	AV4	13	42	88	AV2	10
39	52	AV4	16	53	88	AV4	12
40	52	AV3	23	53	88	AV5	19
52	52	AV3	10	50	89	AV3	11
53	52	AV3	11	50	89	AV4	14
56	52	AV3	12	50	89	AV5	10
40	54	AV3	15	50	89	AV6	13
48	56	AV3	12	51	89	AV3	12
59	56	AV4	15	51	89	AV4	33
40	58	AV1	14	51	89	AV5	28
40	58	AV2	29	51	89	AV6	17
40	58	AV3	35	51	90	AV4	15
40	58	AV4	19	51	90	AV5	14
40	58	AV5	45	53	90	AV4	11
40	58	AV6	13	53	90	AV6	10
40	63	AV3	12	49	91	AV2	22
43	64	AV1	18	49	91	AV3	12
49	66	AV2	19	50	91	AV4	8
49	66	AV3	17	51	91	AV3	10
50	70	AV4	16	51	91	AV4	14
58	70	AV2	13	51	91	AV5	19
51	71	AV6	9	51	91	AV6	17
44	72	AV5	15	52	91	AV4	14
51	72	AV2	9	38	100	AV3	13
51	72	AV3	9	36	106	AV3	9
51	72	AV4	8	36	106	AV4	13
51	72	AV5	9	36	106	AV5	10
57	72	AV1	13	36	106	AV6	13
57	72	AV3	11	39	107	AV2	11
40	73	AV5	14	28	115	AV1	12
40	73	AV6	12	28	115	AV6	18
43	73	AV4	21	12	121	AV6	8

¹ AV# - Location of AVB intersection with the tube (up to 6)

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Vogtle 2R14: SG3 AVB Wear Indications

Row	Col	Location [†]	2R14 % TWD	Row	Col	Location [†]	2R14 % TWD
32	12	AV2	13	57	62	AV4	13
32	12	AV5	19	35	64	AV4	5
34	13	AV5	18	42	64	AV1	6
41	19	AV4	13	42	64	AV2	18
42	20	AV3	13	42	64	AV3	12
42	20	AV4	13	42	64	AV4	27
44	23	AV3	12	42	64	AV5	16
50	29	AV4	11	44	64	AV4	6
48	37	AV3	15	44	68	AV3	6
51	38	AV5	9	39	72	AV2	18
54	38	AV5	16	39	72	AV3	21
57	48	AV4	16	39	72	AV4	21
57	48	AV5	15	41	77	AV3	12
57	48	AV6	15	41	77	AV4	27
57	49	AV4	11	41	77	AV5	25
58	49	AV1	14	57	78	AV2	11
58	49	AV5	12	56	82	AV2	26
58	49	AV6	11	56	82	AV3	37
42	53	AV4	7	56	82	AV4	22
43	62	AV4	9	52	83	AV2	17
45	62	AV4	10	52	83	AV3	28
46	62	AV4	12	52	83	AV4	23
53	62	AV3	12	52	83	AV5	22
53	62	AV5	6	30	112	AV5	13
54	62	AV2	7	12	121	AV1	10

[†] AV# - Location of AVB intersection with the tube (up to 6)

Tube Plugging

The following table contains all SG tubes plugged in Vogtle 2R14 and the related degradation mechanism.

2R14 Plugged Tubes (2)

SG	Row	Col	Degradation Mechanism
2	40	58	AVB Wear > 40%TW
2	52	73	AVB Wear > 40%TW

Total plugging in the SGs after 2R14 is as follows:

- SG 1 – 6 tubes for a total of 0.11% tubes plugged
- SG 2 – 14 tubes for a total of 0.25% tubes plugged
- SG 3 – 4 tubes for a total of 0.07% tubes plugged
- SG 4 – 21 tubes for a total of 0.37% tubes plugged

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Secondary Side Inspections

Sludge lancing and FOSAR was performed in all four steam generators. 35 total lbm of sludge was removed. An upper bundle in-bundle (UBIB) inspection was performed in SG2 with no abnormal observations.

Condition Monitoring Conclusions

Upon completion of the scheduled +Point programs for the tubesheet H* region, the top of the tubesheet, the BLG/OXP population, DNG/DNT locations, and small radius U-bends, no indications were found to exceed the NEI 97-06 performance criteria specified in the Degradation Assessment. This is inclusive of +Point testing of I-code indications.

The volumetric indication seen in 2R14 was determined, by history review, to be from interaction with sludge lancing equipment.

None of the AVB wear indications in either SG2 or SG3 exceed the NEI 97-06 performance criteria given in the 2R14 Degradation Assessment. Two tubes were plugged due to AVB wear indications that exceeded the Technical Specifications plugging criteria.

No secondary side tube damage attributable to foreign objects was identified from the FOSAR and visual inspections.

Given the absence of operating leakage during Cycle 14, it is concluded that there was no leakage from plugs. This is consistent with the video inspection of the tube plugs which produced no exceptions to expected conditions.

Slippage Monitoring was performed in accordance with regulatory commitments for licensing of the H* Alternate Repair Criteria. Analysis for tube slippage associated with Slippage Analysis Signal (SVR) was completed for all tubes in SG2 and SG3. No SVR signals were observed.

No In-Situ tests or tube pulls were required to demonstrate tube integrity.

Evaluation of the indications found in the 2R14 inspections confirms that the tube integrity structural and leakage performance criteria condition monitoring requirements as specified in NEI-97-06 Revision 2 are satisfied.