

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

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U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

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VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)
NORTH ANNA POWER STATION UNIT 2
STEAM GENERATOR TUBE INSPECTION REPORT

Pursuant to Technical Specification 5.6.7 for North Anna Power Station Unit 2, Dominion is required to submit a 180-day steam generator tube inspection report. The attachment to this letter provides the steam generator tube inspection report for the North Anna Unit 2 Spring 2019 outage.

Should you have any questions or require additional information, please contact Mr. Daniel P. McGinnis at (540) 894-2487.

Very truly yours,



N. Larry Lane
Site Vice President

Attachment

Commitments made in this letter: None

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NRR

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ATTACHMENT

**NORTH ANNA UNIT 2
180-DAY NRC REPORT REGARDING
STEAM GENERATOR TUBE INSPECTION
PER TECHNICAL SPECIFICATION 5.6.7**

**VIRGINIA ELECTRIC AND POWER COMPANY
(DOMINION)**

SPRING 2019 - NORTH ANNA UNIT 2 STEAM GENERATOR INSPECTIONS

The following satisfies the North Anna Power Station Technical Specification (TS) reporting requirement section 5.6.7. During the North Anna Unit 2, spring 2019 refueling outage, steam generator (SG) inspections in accordance with TS 5.5.8.d were completed for all three steam generators ("A", "B" and "C").

The Unit 2 Steam Generators have accrued 22.1 Effective Full Power Years (EFPY) of operation as of the end of Cycle 26 (March, 2019).

Initial entry into Mode 4 occurred on April 7, 2019 (0135 Hrs); therefore, this report is required to be submitted by October 4, 2019.

Italicized wording represents TS verbiage. The required information is provided under each reporting requirement as follows:

A report shall be submitted within 180 days after the initial entry into Mode 4 following completion of an inspection performed in accordance with the Specification 5.5.8, "Steam Generator (SG) Program." The report shall include:

a. The scope of inspections performed on each SG

The following primary side inspections were performed in each steam generator:

- Visual examination of both channel heads (as-found / as-left) specifically including:
 - all plugs
 - the divider plate weld region
 - the bottom of the bowl per NSAL-12-1 and NRC IN 2013-20 with the bowl dry
- 100% full-length inspection utilizing bobbin coil probes for all tubes except for Row 1 U-bends
- 100% Row 1 (98 tubes) U-bend region utilizing rotating coil probe
- 29% of hot leg top of tubesheet (+/-3") utilizing rotating coil probe with tube selection including 50% of the secondary side critical area in the sludge zone, 50% of all tubes within five tubes of the bundle periphery, and other randomly sampled locations
- 17% of cold leg top of tubesheet (+/-3") utilizing rotating coil probe with tube sample constituting 56% of all tubes within five tubes of the bundle periphery
- Special interest inspections of dents/dings with rotating coil probe (Sample: 100% of dents/ding \geq 5 Volts)
- Augmented sample inspections were performed in areas of special interest including hot leg expansion transitions, tube overexpansion locations. Results identified in Table 1 below.

Table 1 – Bobbin Probe Indication / Special Interest Exam Summary

KEY: tubes / indications / indications tested with +Point	SG "A"	SG "B"	SG "C"
TSP Wear	0 / 0 / 0	5 / 7 / 7	4 / 5 / 5
Dents ≥5 Volts	2 / 2 / 2	2 / 2 / 2	1 / 1 / 1
Hot Leg MBH	14 / 14 / 14	18 / 19 / 19	11 / 11 / 11
Hot Leg OXP	353 / 451 / 36	323 / 445 / 20	503 / 790 / 23
Cold Leg OXP	149 / 170 / 4	490 / 657 / 8	605 / 1002 / 4
OVR	5 / 5 / 5	0 / 0 / 0	2 / 2 / 2
NTE	0 / 0 / 0	4 / 4 / 4	2 / 2 / 2

The following secondary side inspections were performed in each steam generator:

- Steam drum visual inspections to evaluate the cleanliness and structural condition of all accessible subcomponents including moisture separators, drain systems, and interior surfaces.
- Drop down examinations through the primary separators to assess the cleanliness and structural condition of the upper tube bundle and AVB supports.
- Visual inspections of J-nozzle to feedring internal interface for flow assisted corrosion in the carbon steel portions of the feedrings.
- Visual inspections of upper tube support plates via 7th TSP handholes to assess structural condition and cleanliness, including that of TSP wedges and associated welds.
- Ultrasonic thickness measurement of selected feedring locations.

The results of all secondary-side visual examinations performed were satisfactory.

b. Degradation mechanisms found

Tube Support Plate (TSP) wear was the only tube degradation mechanism reported during this inspection.

c. Nondestructive examination techniques utilized for each degradation mechanism

Table 2 identifies the examination technique used for the identified degradation mechanism.

Table 2 - Degradation Mechanisms and Inspection Techniques

Classification	Degradation Mechanism	Location	Probe Type
Existing	Wear	Tube Support Plate (TSP)	Detection – Bobbin Sizing - +Point™

d. Location, orientation (if linear), and measured sizes (if available) of service induced indications

As stated in the (b) response above, service induced indications were identified. Table 3 below provides the required information.

Table 3 - Tube Degradation Summary

SG	Row	Col	Location	ETSS	Max Depth (%TW)	In-Situ Testing Required?	Plugging Required?
A	No degradation detected during 2R26						
B	1	19	03C -0.75 to +0.18	96910.1	12	No	No
B	2	56	03C -0.71 to -0.17	96910.1	8	No	No
			05C -0.82 to -0.32	96910.1	9	No	No
			05C -0.80 to -0.27	96910.1	8	No	No
B	2	58	05C -0.84 to -0.41	96910.1	6	No	No
B	3	15	05C -0.43 to +0.33	96910.1	12	No	No
B	22	86	05C -0.88 to -0.44	96910.1	8	No	No
C	2	13	02C -0.31	96910.1	8	No	No
C	2	93	03C +0.43	96910.1	5	No	No

C	7	97	05C -0.60	96910.1	5	No	No
			05C +0.34	96910.1	9	No	No
C	9	97	05C -0.61	96910.1	6	No	No

- e. *Number of tubes plugged during the inspection outage for each active degradation mechanism*

No tubes were plugged during this inspection.

- f. *The number and percentage of tubes plugged to date, and the effective plugging percentage in each steam generator,*

Table 4 summarizes the current tube plugging status for North Anna Unit 2 steam generators.

Table 4 – Current Tube Plugging Status

Steam Generator	Number of Plugged Tubes	Percent Plugged
A	1	0.03%
B	0	0.00%
C	7	0.19%
Total	8	0.07%

Since no sleeving has been performed in the North Anna Unit 2 SGs, the effective plugging percentage is the same as the actual plugging percentage.

- g. *The results of condition monitoring, including the results of tube pulls and in-situ testing*

No tubes were pulled and no in-situ pressure tests were performed. The condition monitoring assessment concluded that the structural integrity, operational leakage, and accident-induced leakage performance criteria were not exceeded during the operating interval preceding 2R26.