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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 2007 refueling outage.

This letter does not establish any new commitments. Should you have any questions or require additional information, please contact Mr. Thomas Shaub at (804) 273-2763.

Very truly yours,

C. L. Funderburk, Director
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Attachment

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ATTACHMENT

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

NORTH ANNA UNIT 2 – SPRING 2007

The following satisfies the North Anna Power Station Technical Specification (TS) reporting requirement section 5.6.7. During the North Anna spring 2007 refueling outage, steam generator inspections in accordance with TS 5.5.8.d were completed for two of the three steam generators ("A" and "C"). This was the initial inspection under the modified Technical Specifications resulting from the TSTF-449 generic specification issued to the industry. Consequently, the referenced outage is the starting point for compliance to the periodicity and tube inspection coverage requirements of 5.5.8.d.

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 steam generators "A" and "C"

- 100% full-length inspection utilizing bobbin coil probe for all tubes except for Row 1 u-bends
- 20% (719 tubes) hot leg top of tubesheet (+/- 3") utilizing rotating coil probe with tube selection biased toward a secondary side critical area in the sludge zone, peripheral area tubes, and the remainder across the tubesheet
- 100% Row 1 (98 tubes) U-bend region utilizing rotating coil probe
- Special interest inspections of freespan dent/ding/bulges > 2 volts with rotating coil probe
- Inspection of bobbin identified I-codes (i.e. possible indications) with rotating coil probe
- Special interest rotating coil probe exams of within tubesheet anomalies; overexpansions

The following secondary side inspections were performed in steam generators "A" and "C"

- Steam drum upper components visual inspection covering the primary and secondary moisture separators, drain piping, and related components
- Video inspection of the upper tube bundle U-bend area
- Video inspection of the uppermost tube support plate (TSP), i.e. 7th TSP in the periphery area and in-bundle at selected tube columns. The 4th, 5th, and 6th TSPs were video inspected in the center bundle area accessed from the 7th TSP.
- Video inspection of the inside interface of the feeding to J-nozzle joints, i.e. exit spargers, and ultrasonic thickness inspection of selected feeding components

b. Active degradation mechanisms found

No indication of corrosion degradation was observed during this inspection. Through wall (TW) volumetric wear degradation was observed on three (3) tubes adjacent to the support plate TSP quatrefoil contact points on the “C” steam generator. A similar indication was observed on this generator, plugged, and reported in a previous report following the 2001 inspections. Of the three newly observed indications, one was reported at 40% TW and the other two at less than 10% TW.

No degradation of any type was observed on the “A” steam generator.

The secondary side inspections on both steam generators indicated no component degradation that would compromise tube integrity.

c. Nondestructive examination techniques utilized for each degradation mechanism

Inspections on both steam generators focused on the following degradation mechanisms listed in Table 1 utilizing the referenced eddy current techniques.

Table 1 – Inspection Method for Applicable Degradation Modes

Classification	Degradation Mechanism	Location	Probe Type
Potential	Tube Wear	Anti-Vibration Bars	Bobbin – Detection Bobbin and +Point™ – Sizing
Potential	Tube Wear	Flow Distribution Baffle	Bobbin – Detection Bobbin and +Point™ – Sizing
Existing	Tube Wear	Tube Support Plate	Bobbin – Detection Bobbin and +Point™ – Sizing
Potential	Tube Wear	Straight Leg & AVB Tangents (Row 8, 14, 26)	Bobbin – Detection Bobbin or +Point™ – Sizing
Existing	Tube Wear (foreign objects)	Freespan and Top-of-Tubesheet	Bobbin – Detection +Point™ - Sizing
Potential	ODSCC	Hot Leg Top-of-Tubesheet Sludge Pile Area	Bobbin and +Point™ – Detection +Point™ - Sizing
Relevant/Informational Inspection	PWSCC	Hot Leg Top-of-Tubesheet Sludge Pile Area and within Tubesheet Anomaly locations	+Point™ – Detection and Sizing
Relevant/Informational Inspection	ODSCC PWSCC	Row 1 U-bends	+Point™ – Detection and Sizing
Relevant/Informational Inspection	ODSCC	Freespan and Tube Supports	+Point™ – Detection and Sizing
Relevant/Informational Inspection	OD Pitting	Top-of-Tubesheet	Bobbin and +Point™ – Detection +Point™ - Sizing

The only degradation noted in (b) above was identified during the bobbin probe examinations on the “C” steam generator. The sizing of the degradation was performed utilizing a rotating coil based eddy current technique.

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

No wall loss indications were found during the inspection on the "A" steam generator. As noted in the response to (b) above, several wear type indications were noted on the "C" steam generator. Table 2, below, provides the detailed information regarding these indications. Also included there is information on a permeability indication (PVN) that could not be resolved due to updated signal to noise requirements in current inspections.

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

Four tubes were plugged during the spring 2007 inspection. Those tubes indicated in Table 2 were plugged. One tube required plugging since it was at the TS plugging limit of 40% TW. The other two wear indications were preventively plugged. The fourth tube was preventively plugged since the permeability indication rendered a significant portion of the tube un-inspectable.

f. Total number and percentage of tubes plugged to date

A total of six (6) tubes have been plugged in the North Anna Unit 2 steam generators, i.e. "A" – 1 (0.03%), "B" – 0 (0%), "C" – 5 (0.14%) with a total percentage of 0.056 %.

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

The condition monitoring evaluation was completed and neither steam generator, "A" or "C", exceeded any performance criteria during the last cycle since the fall 2005 inspection. No findings at the spring 2007 inspection invalidated the previous operational assessment for any of the three steam generators. Condition monitoring requirements were met since the detected flaws TW depth was less than the conservative structural limit for this type of flaw, i.e. 66.4% for bounding 0.6" long 360 degree volumetric degradation. Therefore, no tube pulls or in-situ pressure testing was necessary.

h. The effective plugging percentage for all plugging in each SG

There are no sleeves installed in the North Anna Unit 2 steam generators therefore, the effective plugging percentage remains the same as stated in (f) above.

Table 2 – Significant Reported Indications

SG	Row/Column	Location	Finding	Axial Length	Circumferential Length	Maximum Depth Through Wall, As Measured	Detectable w/ Bobbin?	Detectable in History?	Plugged?	Reason
C	13/76	@3 Hot TSP -0.62"	Volumetric Damage	0.35"	0.50"	8%	Yes	No (1996)	Yes	Preventive - Near structural limit @ 3 cycles of operation ¹
C	45/50	@5 Cold TSP +0.65"	Volumetric Damage	0.43"	0.42"	8%	Yes	No (2001)	Yes	Preventive - Near structural limit @ 3 cycles of operation ¹
C	45/51	@5 Cold TSP +0.51"	Volumetric Damage	0.43"	0.48"	40%	Yes	No (2001)	Yes	At Tech. Spec. as found plugging limit
C	42/32	Near full length of Cold Leg	Signal Noise (Multiple Permeability Indications)	N/A	N/A	N/A	Yes	Yes, baseline and subsequent	Yes	Preventive – Avoid continuing future magnetic biased rotating probe inspections

Note 1: Assumes applying maximum observed growth rate of tube 45/51 and 95%/50% probability/confidence for technique and analyst uncertainty.