

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

October 19, 2016

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

Serial No. 16-248A
NAPS/JHL
Docket No. 50-339
License No. NPF-7


VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)
NORTH ANNA POWER STATION UNIT 2
RESPONSE TO STEAM GENERATOR TUBE INSPECTION REPORT
REQUEST FOR ADDITIONAL INFORMATION

Dominion letter dated July 12, 2016 (Serial No. 16-248) submitted information summarizing the results of the spring 2016 steam generator tube inspections for North Anna Unit No. 2.

In an email dated September 20, 2016, the Nuclear Regulatory Commission (NRC) transmitted a request for additional information (RAI) related to the North Anna Unit 2 steam generator tube inspections. The Dominion response to the RAI is provided in the Attachment.

If you have any questions or require additional information, please contact Mr. Donald R. Taylor at (540) 894-2100.

Very truly yours,


Gerald T. Bischof
Site Vice President

Attachment

Commitments made in this letter: None

AD47
NRR

cc: U.S. Nuclear Regulatory Commission
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ATTACHMENT

**NORTH ANNA UNIT 2
RESPONSE TO STEAM GENERATOR TUBE INSPECTION REPORT
REQUEST FOR ADDITIONAL INFORMATION**

**VIRGINIA ELECTRIC AND POWER COMPANY
(DOMINION)
NORTH ANNA POWER STATION UNIT 2**

RESPONSE TO STEAM GENERATOR TUBE INSPECTION REPORT REQUEST FOR ADDITIONAL INFORMATION

RAI 1

Please discuss the scope and results of the channel head video examinations.

Dominion Response

Scope:

Perform video examination of both channel heads (as-found / as-left), specifically inspections identified in Nuclear Safety Advisory Letter (NSAL) 12-1 including the divider plate / tubesheet interface, drain tubes, and previously installed plugs.

Westinghouse issued NSAL-12-1 regarding Steam Generator Channel Head Degradation. The recommended action is to perform a visual scan of both hot and cold legs of the inside surface of the channel head during the next scheduled opening of the primary manways for each steam generator (SG). Key areas of inspection shall include the channel head cladding, the divider plate-to-channel head weld and the weld at the top of the channel head bowl drain tube. The inspection shall look for evidence of gross defects such as indications in welds, missing weld filler material, a breach of the weld metal, unusual discoloration of the weld metal, dings or gouges, etc.

Results:

SG "A" had two previously installed plugs (1 tube) and SG "C" had ten previously installed plugs (5 tubes). All twelve of the previously installed plugs were visually examined to confirm that the plugs were still present and that there were no signs of excessive boric acid build up indicative of leaking plugs. All of the plug visual examination results were satisfactory.

A video camera visual examination in accordance with the requirements of NSAL-12-1 was conducted on SG "A" and "C" which were the only steam generators with open primary manways during End of Cycle (EOC) 24. The dry-bowl visual examination found no evidence of gross defects such as indications in welds, missing weld filler material, a breach of the weld metal, unusual discoloration of the weld metal, dings or gouges, etc.

RAI 2

Please discuss the results of the secondary side inspections.

Dominion Response

The internal feeding / J-nozzle interfaces of all 35 J-nozzles in SG "A" and 6 J-nozzles in "C" were visually examined. All J-nozzles were confirmed to be present and intact.

The video record for each J-nozzle was reviewed and no evidence of flow assisted corrosion (FAC) was identified.

In addition, the internal feeding / J-nozzle interfaces of all 35 J-nozzles in SG "A" were ultrasonically examined (UT) with no evidence of degradation. The internal feedwater header pipe was also ultrasonically examined in several areas in both SG "A" and "C".

Eddy current examinations did not identify any possible loose parts (PLP) at the top of the tubesheets in SG "A" and "C". Therefore, top of tubesheet visual examinations were not performed in either of the two (A and C) steam generators inspected during this outage. One foreign object was identified by eddy current at the third tube support plate on the cold leg of SG "C". This location was not accessible by the foreign object search and retrieval (FOSAR). The possible loose part was left in place and two tubes were plugged and stabilized at this tube location.

Ultrasonic Test (UT) inspections performed on the Unit 2 "B" SG feeding during the last outage (2R23) identified localized exterior erosion on the side of the feeding thermal sleeve below the discharge of nozzle #35, with a minimum measured wall thickness of 0.291". The localized erosion has been evaluated to justify continued operation until this outage (2R24). The eroded region was successfully repaired during the current outage (2R24) with a weld overlay to build up the wall thickness.

RAI 3

Please provide the location and sizes of the eight new dents reported in steam generator (SG) A. Also, please provide any insight you have into the cause of these new service induced indications.

Dominion Response

No indications of degradation were detected in SG "A", although 8 new dents were reported in 7 tubes with 5 new dents occurring at anti-vibration bar (AVB) #1. The new dents were scattered throughout the bundle rather than clustered near each other. All of the new dents ranged from 2.0 to 2.4 volts, were examined with a rotating probe, and showed no signs of degradation.

Additionally, 39 and 31 historical dents were observed again in SG A and SG C respectively. The historical dents range from 1.5 to 12.1 volts with an average of 2.9 volts. We have no insight as to the cause(s) of the new or existing service induced indications.

New Dents

SG	Row	Col	Volts	Phase	Indication	Location
A	16	25	2.19	189	DNT	AV5+7.05"
A	25	44	2.00	185	DNT	AV1-0.05"
A	25	44	2.07	183	DNT	AV6-0.05"
A	31	51	2.08	178	DNT	04C+0.35"
A	36	19	2.00	187	DNT	AV1-0.13"
A	39	23	2.13	184	DNT	AV1-0.08"
A	39	50	2.39	186	DNT	AV1-0.03"
A	43	55	2.11	184	DNT	AV1-0.08"

RAI 4

The circumferential extent (i.e., arc length) of the two wear indications in SG C, created by contact with tube support plates (TSP) were listed as 49 degrees and 42 degrees. Please provide the arc lengths of the TSP lands. If the tube wear indications have arc lengths larger than the TSP lands, please discuss and insights.

Dominion Response

The TSP land dimensions are proprietary to the SG design vendor and are not available. We have reviewed the NDE signals and have concluded that the TSP wear indications are contained within the contact land dimension within the accuracy of the NDE technique.

The NDE techniques systematically oversize the indication and TSP land lengths because the probe sees the indication or TSP land before it actually is on top of it (look ahead) and after (look behind) it has past the indication or TSP land.

RAI 5

The arc length of the foreign object wear indication in SG C was listed as 56 degrees. Please provide the arc length of the broached opening in this TSP and discuss how the arc length of the TSP broached opening compares to the size of the foreign object wear indication.

Dominion Response

The broached opening dimensions are proprietary to the SG design vendor and are not available.

We have reviewed the NDE signals and have concluded that the foreign object wear indication is contained within the broached opening within the accuracy of the NDE technique.

The NDE techniques systematically oversize the flaw and TSP land lengths and undersize the broached opening dimension because the probe sees the indication or TSP land before it actually is on top of it (look ahead) and after (look behind) it has past the indication or TSP land.