VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

June 29, 2022

U.S. Nuclear Regulatory Commission
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Washington, D.C. 20555

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VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION ENERGY VIRGINIA)
NORTH ANNA POWER STATION UNITS 1 AND 2
STEAM GENERATOR TUBE INSPECTION REPORT

Pursuant to Technical Specification 5.6.7 for North Anna Power Station Units 1 and 2, Dominion Energy Virginia is required to submit a 30-day steam generator tube inspection report upon implementation of Technical Specification Task Force (TSTF) 577, Revised Frequencies for Steam Generator Tube Inspections, Revision 1. Attachments 1 and 2 to this letter provides the steam generator tube inspection reports for North Anna Power Station Units 1 and 2.

Should you have any questions or require additional information, please contact Mr. Marcus Hofmann at (540) 894-2100.

Very truly yours,

Lisa Hilbert
Site Vice President

Attachments

Commitments made in this letter: None

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Attachment 1

North Anna Power Station Unit 1

End of Cycle 26 Revised Steam Generator Tube Inspection Report

VIRGINIA ELECTRIC AND POWER COMPANY
(DOMINION ENERGY VIRGINIA)

End of Cycle 26 Revised Steam Generator Tube Inspection Report

In accordance with North Anna Power Station Unit 1 (NAPS1) Technical Specification (TS) 5.6.7, Virginia Electric And Power Company (Dominion) is submitting this Steam Generator Tube Inspection Report which describes the results of the previously completed NAPS1 steam generator (SG) examinations. Based upon entry into Mode 4 on April 13, 2018, a report was required to be submitted by October 10, 2018. Due to adopting a revised Technical Specification, TSTF-577 Rev. 1, a revised Steam Generator Tube Inspection Report is required to be submitted within 30 days after implementation of the license amendment.

The three North Anna Unit 1 steam generators are replacement Westinghouse Model 54F lower assemblies (i.e., tube bundle, lower shell, and channel head). They were replaced in 1993. The standard Series 51 design primary moisture separators (three separators per SG, ~51" ID each) performed well and no modifications were deemed necessary; hence they remain in-place in their original configuration. The feedrings are also original equipment.

Each of the three SGs were fabricated with 3,592 Alloy 690TT tubing, with nominal 0.875" OD x 0.050" wall thickness. The seven broached quatrefoil support plates are fabricated from 405 Stainless Steel. Figure 1 contains a schematic depicting the general arrangement of the steam generators without dimensions.

Figures 2 and 3 contain a photo of the Disk Stack and an illustration of its position in the Feedwater Regulating Valve respectively. The Disk Stack provides an effective barrier against foreign objects in the feedwater entering the steam generators. The North Anna Unit 1 Steam Generators had accrued approximately 22.7 Effective Full Power Years (EFPY) of operation as of the End of Cycle 26 (March 2018) and approximately 3.7 EFPY since BOC 27. Since the first sequential period begins after the first in-service inspection, programmatically the North Anna Unit 1 Steam Generators have accrued 25 EFPY. These steam generators operate with a nominal hot-leg temperature of 612°F, with no measurable leakage, and no deviations from the Mandatory and/or Needed (Shall) requirements from the EPRI Guidelines referenced by NEI 97-06.

See Attachment 1, "Acronyms," for explanation of acronyms.

Report:

TS 5.6.7 reporting requirements (in bold text) are provided below, followed by Dominion Energy's response:

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

a. The scope of inspections performed on each SG,

All operational tubes in all three steam generators (a total of 10,774 tubes), were inspected full length with bobbin probes. An augmented sample of 5,195 tube locations was inspected with rotating coil probes.

The rotating probe examination in each SG included a 50% sample of the outer five rows of the hot and cold leg periphery and open tube lane at the top of tubesheet. The primary purpose of this examination was the detection of foreign objects or foreign object wear in the most susceptible regions of the SGs. In addition, the rotating +Point probe examinations included both a pre-planned scope, and EOC26 special interest emergent scope. The pre-planned scope included a 50% sample of tubes in the sludge pile region, historical locations of interest, dents or dings (DNT or DNG), overexpansions or bulges (OXP or BLG), percent through wall indications (%TW), and a sample of non-quantifiable historical indications (NQH). The emergent scope included EOC26 bobbin coil Special Interest (SI) locations such as non-quantifiable indications (NQI) and various hot leg and cold leg bounding locations.

During EOC26 each hot and cold leg primary channel head in all three SGs was visually examined prior to the installation of eddy current probe manipulators and in an as left condition following the eddy current examination. This examination consisted of the divider plate, divider plate to tubesheet interface, previously plugged tubes, and the entire cladded surface in accordance with NSAL 12-1. The examination revealed no evidence of degradation and no evidence of plug leakage. The proper tube number and plug position were verified for all four previously installed plugs (two tubes, both in SG-C).

It should be noted that both terms Dent and Ding refer to a plastic deformation of the tube that results in a reduction in the tube diameter. The two different terms were used to differentiate between the location of the signals. Historically (early generation designs) the term dent referred to local tube diameter reductions due to corrosion products from carbon steel (typically, drilled carbon steel tube support plates). The term ding referred to local tube diameter reductions due to mechanical means (manufacturing, vibration, incidents during maintenance activities, or impact from foreign objects). Since the eddy current signals from both dents and dings are similar, the location of the indication was used to differentiate which term was used (dent for indications at supports and ding for all free span indications).

At NAPS, the referenced dent signals do not represent the same phenomena as classical denting on older generation units caused by drilled carbon steel support plate corrosion damage. Since the NAPS units are not similar in design (i.e., quatrefoil stainless steel tube support plate design vs. drilled hole carbon steel tube support plate design) these same "denting" issues do not directly apply to the NAPS units. Tube support plate areas are not susceptible to denting caused by corrosion of the tube support plates. However, the historical nomenclature assigned to these signals has existed in the database since the steam generators were installed and has remained unchanged since that time.

b. The nondestructive examination techniques utilized for tubes with increased degradation susceptibility;

Rotating +Point probe examinations were performed on a 50% sample of the outer five rows of the hot and cold leg periphery and open tube lane at the top of tubesheet in each SG for the detection of foreign objects or foreign object wear in the most susceptible regions of the SGs.

c. For each degradation mechanism found:

1. The nondestructive examination technique utilized;

The only degradation mechanism found during the 1R26 tube examinations was TSP wear. The examination technique used for the detection of TSP wear was the bobbin probe. The examination technique used for sizing was the +Point probe.

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;

All of the TSP wear indications detected, (16 indications of TSP wear in 10 tubes) measured less than 20% through-wall.

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; and

An arithmetic methodology was used for condition monitoring. The maximum depth of TSP wear identified during 1R26 and returned to service was 15%TW; sized with +Point technique ETSS 96910.1. Conservatively accounting for NDE depth sizing uncertainty, the upper bound returned-to-service depth is 29.8%TW, which does not exceed the conservative structural limit of 57%TW and compares favorably with the previous Operational Assessment predictions (below).

Table 1: Summary of Prior OA Validation

	Assumed or Calculated in the 1R23 Operational Assessment	Observed during 1R26
AVB Wear	Growth rate for three cycles going forward: 7%TW/cycle	No AVB wear identified.
AVB Wear	Minimum projected margin between end-of-three-cycle depth and the structural limit: 14%TW	No AVB wear identified.
TSP Wear	Growth rate for three cycles going forward: 4%TW/cycle	Maximum growth rate observed, 1%TW from 2013 to 2018 (3 cycles): 0.33%TW/cycle
TSP Wear	Minimum projected margin between end-of-three-cycle depth and the structural limit: 12.2 %TW	Minimum observed margin between max 1R26 depth and structural limit: 27.2 %TW
Operational Leakage	Projected: 0	Actual, cycles 24, 25 and 26: 0

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

No tubes were plugged during this examination.

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

An arithmetic methodology was used in the forward-looking integrity assessment for structure wear as summarized below.

Bobbin probe technique ETSS 96041.1 was relied upon during EOC 26 for the detection of AVB wear. The EOC 26 Degradation Assessment (DA) conservatively estimated the depth at 95% POD to be 26%TW; therefore, this value is assumed to be the limiting BOC27 AVB wear depth for OA purposes. Note that this POD was derived assuming ECT data noise characteristics that are significantly more limiting than those observed during the EOC 26 inspection.

Bobbin probe technique ETSS 96004.1 was relied upon during this outage for the detection of TSP/FDB wear and, for ETSS 96004.1, the depth at 95% POD is estimated to be 32%TW. This is quite conservative because the POD was derived assuming ECT data noise characteristics that are significantly more limiting than those observed during the EOC 26 inspection. Because the depth at 95% POD (32%TW) is more limiting than the upper bound returned-to-service depth (29.8%TW), this value is used as the limiting beginning-of-cycle 27 (BOC27) TSP/FDB wear depth for OA purposes.

Table 2: Summary of Current OA Predictions

	Assumed BOC Depth	Assumed Growth Rate	Maximum depth (%) Predicted at Next Inspection	Structural Limit
AVB Wear	26% (None Detected)	Growth rate for five cycles going forward: 5%TW/cycle	51%	61%
TSP Wear	32% (Based on a conservative Bobbin Probe POD)	Growth rate for five cycles going forward: 4%TW/cycle	52%	57%

e. The number and percentage of tubes plugged to date, and the affective plugging percentage in each steam generator,

Table 3: Number of Tubes Plugged to Date

	SG A	SG B	SG C
Prior to 1R26	0	0	2
During 1R26	0	0	0
Total After 1R26	0	0	2
Percentage	0	0	0.06
Overall Percentage	0.02		

Since no sleeving has been performed in the NAPS1 SGs, the effective plugging percentage is the same as the actual plugging percentage.

f. The results of any SG secondary side inspections.

Secondary-side visual examinations were performed in all three steam generators. These examinations included:

- Post-sludge lancing visual examination of top-of-tubesheet annulus and no-tube lane to assess as-left material condition and cleanliness, and to identify and remove any retrievable foreign objects (FOSAR).
- FOSAR identified and removed one metallic foreign object from the secondary side of SG-B (see Table 4).
- Sludge lancing removed a total of 75 pounds of deposit material, (22 pounds from SG-A, 26 pounds from SG-B, and 27 pounds from SG-C).
- Steam drum visual inspections to evaluate the material condition and cleanliness of key components such as moisture separators, drain systems, and interior surfaces.
- Ultrasonic thickness readings of selected feedring locations.
- Visual examination of the upper tube bundles and AVB supports.

The results of all secondary-side visual examinations performed were satisfactory, with no degradation detected.

Table 4: Foreign Object Summary

SG	Description	1R26 SSI	1R26 ECT	1R26 Final Result
B	Small wire ~7/8" long x 3/32" diameter	Initially detected by SSI. Removed.	Adjacent tube examined. No wear.	Absence of wear confirmed. Object removed. No integrity threat going forward.

Figure 1 – General Arrangement

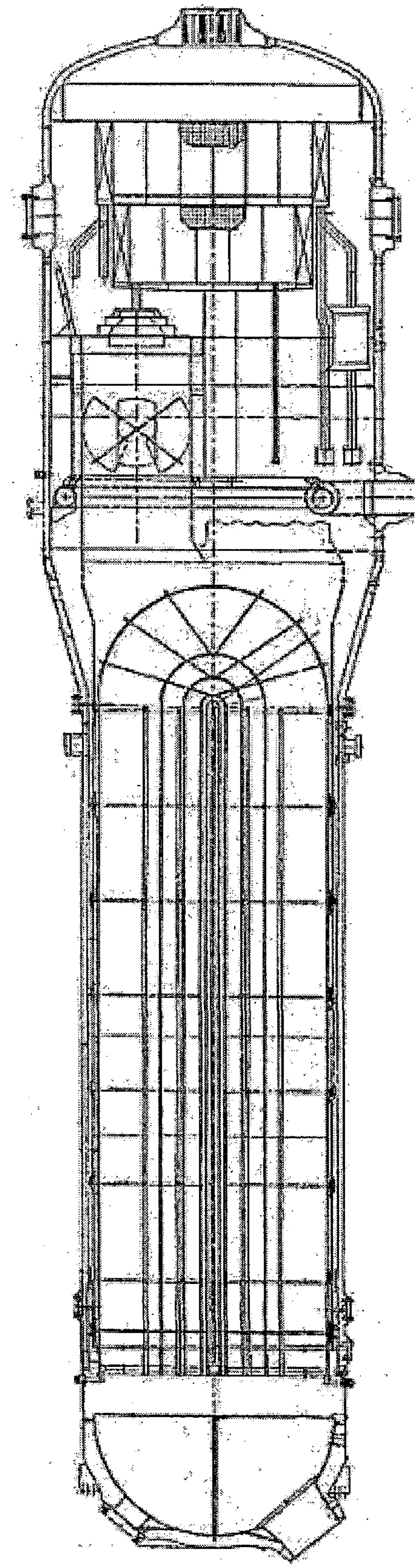


Figure 2 – Disk Stack

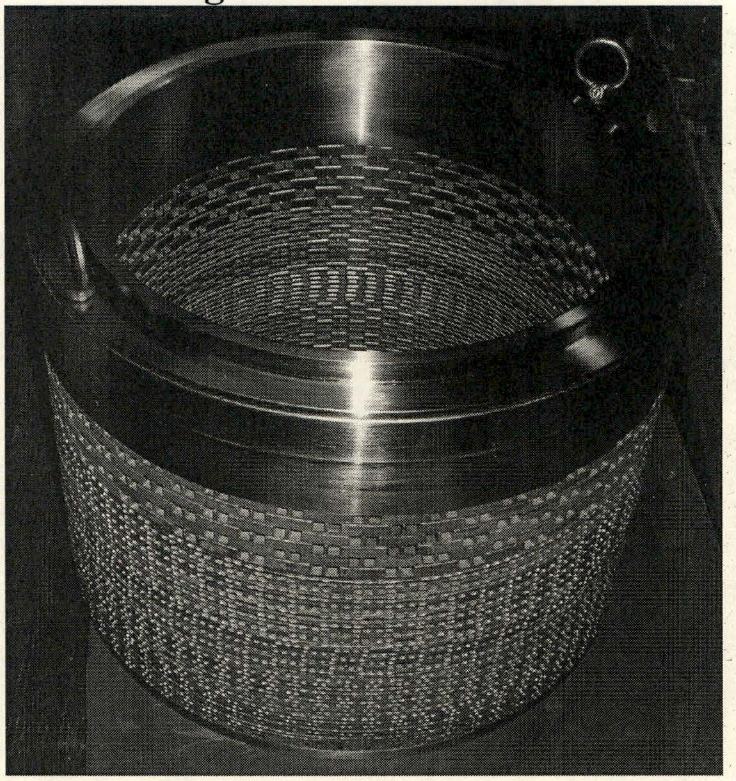
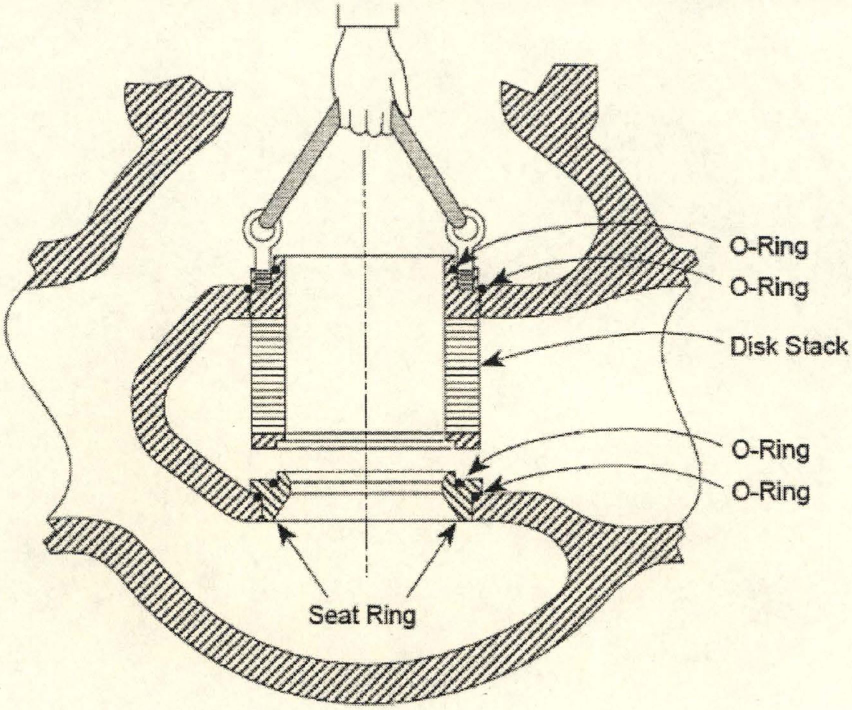


Figure 3 – Disk Stack Location in Feedwater Regulating Valve



Attachment 1

Acronyms

BLG	Bulge
BOC	Beginning of Cycle
CM	Condition Monitoring
CMOA	Condition Monitoring and Operational Assessment
DNG	Ding
DNT	Dent
ECT	Eddy Current Testing
EFPY	Effective Full Power Years
FDB	Flow Distribution Baffle
FOSAR	Foreign Object Search and Retrieval
NAPS	North Anna Power Station
NDE	Non-Destructive Examination
NQH	Non-Quantifiable Historical Indication
NQI	Non-Quantifiable Indication
OXP	Over Expansion
OVR	Over Rolled
PLP	Possible Loose Part
%TW	Percent Through Wall
SG	Steam Generator
SI	Special Interest
SLG	Sludge
SSI	Secondary Side Inspection
TSC	Tube Sheet Cold
TSH	Tube Sheet Hot
TSP	Tube Support Plate

Attachment 2

North Anna Power Station Unit 2

End of Cycle 26 Revised Steam Generator Tube Inspection Report

VIRGINIA ELECTRIC AND POWER COMPANY
(DOMINION ENERGY VIRGINIA)

End of Cycle 26 Revised Steam Generator Tube Inspection Report

In accordance with North Anna Power Station Unit 2 (NAPS2) Technical Specification (TS) 5.6.7, Virginia Electric And Power Company (Dominion) is submitting this Steam Generator Tube Inspection Report which describes the results of the previously completed NAPS2 steam generator (SG) examinations. Based upon entry into Mode 4 on April 7, 2019, a report was required to be submitted by October 4, 2019. Due to adopting a revised Technical Specification, TSTF-577 Rev. 1, a revised Steam Generator Tube Inspection Report is required to be submitted within 30 days after implementation of the license amendment.

The three North Anna Unit 2 steam generators are replacement Westinghouse Model 54F lower assemblies (i.e., tube bundle, lower shell, and channel head). They were replaced in 1995. The standard Series 51 design primary moisture separators (three separators per SG, ~51" ID each) performed well and no modifications were deemed necessary; hence they remain in-place in their original configuration. The feedrings in SG-B and SG-C were replaced when the lower assemblies were replaced. The feedring of SG-A is original equipment.

Each of the three SGs were fabricated with 3,592 Alloy 690TT tubing, with nominal 0.875" OD x 0.050" wall thickness. The seven broached quatrefoil support plates are fabricated from 405 Stainless Steel. Figure 1 contains a schematic depicting the general arrangement of the steam generators without dimensions.

Figures 2 and 3 contain a photo of the Disk Stack and an illustration of its position in the Feedwater Regulating Valve respectively. The Disk Stack provides an effective barrier against foreign objects in the feedwater entering the steam generators. The North Anna Unit 2 Steam Generators had accrued approximately 21.1 Effective Full Power Years (EFPY) of operation as of the End of Cycle 26 (March 2019) and approximately 2.75 EFPY since BOC 27. Since the first sequential period begins after the first in-service inspection, programmatically the North Anna Unit 1 Steam Generators have accrued approximately 22.55 EFPY. These steam generators operate with a nominal hot-leg temperature of 612°F, with no measurable leakage, and no deviations from the Mandatory and/or Needed (Shall) requirements from the EPRI Guidelines referenced by NEI 97-06.

See Attachment 1, "Acronyms," for explanation of acronyms.

Report:

TS 5.6.7 reporting requirements (in bold text) are provided below, followed by Dominion Energy's response:

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

a. The scope of inspections performed on each SG,

All operational tubes in all three steam generators (a total of 10,768 tubes), were inspected full length with bobbin probes. An augmented sample of 5,368 tube locations was inspected with rotating coil probes.

The rotating probe examination in each SG included a 50% sample of the outer five rows of the hot and cold leg periphery and open tube lane at the top of tubesheet. The primary purpose of this examination was the detection of foreign objects or foreign object wear in the most susceptible regions of the SGs. In addition, the rotating +Point probe examinations included both a pre-planned scope, and EOC26 special interest emergent scope. The pre-planned scope included a 50% sample of tubes in the sludge pile region, historical locations of interest, dents or dings (DNT or DNG), overexpansions or bulges (OXP or BLG), percent through wall indications (%TW), and a sample of non-quantifiable historical indications (NQH). The emergent scope included EOC26 bobbin coil Special Interest (SI) locations such as non-quantifiable indications (NQI) and various hot leg and cold leg bounding locations.

During EOC26 each hot and cold leg primary channel head in all three SGs was visually examined prior to the installation of eddy current probe manipulators and in an as left condition following the eddy current examination. This examination consisted of the divider plate, divider plate to tubesheet interface, previously plugged tubes, and the entire cladded surface in accordance with NSAL 12-1. The examination revealed no evidence of degradation and no evidence of plug leakage. The proper tube number and plug position were verified for all eight previously installed plugs (one tube in SG-A and seven tubes in SG-C).

It should be noted that both terms Dent and Ding refer to a plastic deformation of the tube that results in a reduction in the tube diameter. The two different terms were used to differentiate between the location of the signals. Historically (early generation designs) the term dent referred to local tube diameter reductions due to corrosion products from carbon steel (typically, drilled carbon steel tube support plates). The term ding referred to local tube diameter reductions due to mechanical means (manufacturing, vibration, incidents during maintenance activities, or impact from foreign objects). Since the eddy current signals from both dents and dings are similar, the location of the indication was used to differentiate which term was used (dent for indications at supports and ding for all free span indications).

At NAPS, the referenced dent signals do not represent the same phenomena as classical denting on older generation units caused by drilled carbon steel support plate corrosion damage. Since the NAPS units are not similar in design (i.e., quatrefoil stainless steel tube support plate design vs. drilled hole carbon steel tube support plate design) these same "denting" issues do not directly apply to the NAPS units. Tube support plate areas are not susceptible to denting caused by corrosion of the tube support plates. However, the historical nomenclature assigned to these signals has existed in the database since the steam generators were installed and has remained unchanged since that time.

b. The nondestructive examination techniques utilized for tubes with increased degradation susceptibility;

Rotating +Point probe examinations were performed on a 50% sample of the outer five rows of the hot and cold leg periphery and open tube lane at the top of tubesheet in each SG for the detection of foreign objects or foreign object wear in the most susceptible regions of the SGs.

c. For each degradation mechanism found:

1. The nondestructive examination technique utilized;

The only degradation mechanism found during the EOC26 tube examinations was Tube Support Plate (TSP) wear. The examination technique used for the detection of TSP wear was the bobbin probe. The examination technique used for sizing was the +Point probe.

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;

All of the TSP wear indications detected, (12 indications of TSP wear in 9 tubes) measured less than 20% through-wall.

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; and

An arithmetic methodology was used for condition monitoring. The maximum depth of TSP wear identified during the EOC26 inspection and returned to service was 12%TW; sized with +Point technique ETSS 96910.1. Conservatively accounting for NDE depth sizing uncertainty, the upper bound returned-to-service depth is 26.9%TW, which does not exceed the conservative structural limit of 57%TW and compares favorably with the previous Operational Assessment predictions (below).

Table 1: Summary of Prior OA Validation

	Assumed or Calculated in the EOC23 and EOC24 Operational Assessments	Observed during EOC26
AVB Wear	Growth rate for three cycles going forward: 7%TW/cycle	No AVB wear identified.
AVB Wear	Minimum projected margin between end-of-three-cycle depth and the structural limit: 13%TW and 20%TW	No AVB wear identified.
TSP Wear	Growth rate for three cycles going forward: 10%TW/cycle and 4%TW/cycle	Maximum growth rate observed, 12%TW from 2010 to 2019 (6 cycles): 2%TW/cycle
TSP Wear	Minimum projected margin between end-of-three-cycle depth and the structural limit: 0.3%TW and 17.6%TW	Minimum observed margin between max EOC26 depth and structural limit: 30.1 %TW
Operational Leakage	Projected: 0	Actual, cycles 24, 25 and 26: 0

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

   No tubes were plugged during this examination.

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

An arithmetic methodology was used in the forward-looking integrity assessment for structure wear as summarized below.

The maximum depth of TSP wear identified during 2R26 and returned to service was 12%TW; sized with +Point technique ETSS 96910.1. Conservatively accounting for NDE depth sizing uncertainty, the upper bound returned-to-service depth is 26.9%TW.

Bobbin probe technique ETSS 96004.1 was relied upon during this outage for the detection of TSP wear and, for ETSS 96004.1, the depth at 95% POD is estimated to be 15%TW. Note that this was derived using EPRI's MAPOD methodology based on TSP ECT data noise characteristics observed during the 2R26 inspection.

Because the upper bound returned-to-service depth (26.9%TW) is more limiting than the depth at 95% POD (15%TW), this value is used as the limiting beginning-of-cycle 27 (BOC27) TSP wear depth for OA purposes.

The reported TSP wear flaws have experienced minimal discernible growth and since relatively few TSP wear indications have been identified to date, it is not possible to derive a 95%/50% growth rate. Consistent with previous OAs, these results continue to justify a conservative growth rate assumption of 4%TW/cycle going forward.

Adjusting the BOC27 depth upward to reflect three fuel cycles of growth yields the end-of-cycle upper bound depth (EOCUBD):

BOC27 = 26.9%TW	maximum throughwall depth of undetected TSP wear at the beginning of Cycle 27
EOCUBD = BOC27 + (5 cycles)(4%TW/cycle)	end of cycle upper bound depth after five operating cycles

EOCUBD = 46.9%TW << 57%TW

Since this value is below the structural limit of 57.0 %TW (for full TSP thickness), there is reasonable assurance that TSP wear will not exceed the structural performance criteria prior to the next inspection of any of the North Anna Unit 2 SGs. As such, no accident leakage or operational leakage concerns exist relative to TSP wear for any of the SGs. The stated structural limit is based on Regulatory Guide 1.121 requirements which include the effects of non-pressure loads which occur under evaluated accident conditions.

Even though no AVB wear indications have been identified in the North Anna SGs to date, it could reasonably be expected to develop eventually because similar design steam generators (Fs and F-Types) have reported AVB wear. The performance of the North Anna steam generators is expected to at least equal that of Surry since close-gap AVB tolerance techniques were used during the manufacture of the North Anna SGs. In fact, well before Surry had operated for the amount of time that the North Anna units have operated, Surry had already experienced AVB wear. Therefore, the Surry AVB wear experience was used to perform a bounding evaluation of potential North Anna AVB wear.

Bobbin probe technique ETSS 96041.1 was relied upon during this outage for the detection of AVB wear and, for ETSS 96041.1, the depth at 95% POD is estimated to be 15%TW. Note that this was derived using EPRI's MAPOD methodology based on AVB ECT data noise characteristics observed during the 2R26 inspection.

An assumed AVB wear growth rate of 7%TW per operating cycle was used to project the depth of future AVB wear for comparison with the applicable structural limit (61%TW). This growth rate is a conservative and is assumed, based on the absence of any detectable AVB wear to date, to be bounding for AVB wear at NAPS2.

Adjusting the BOC27 depth upward to reflect three fuel cycles of growth yields the end-of-cycle upper bound depth (EOCUBD):

BOC27 = 15%TW	maximum throughwall depth of undetected AVB wear at the beginning of Cycle 27
EOCUBD = BOC27 + (5 cycles)(7%TW/cycle)	end of cycle upper bound depth after five operating cycles
EOCUBD = 50%TW << 61%TW	Structural limit easily met in five cycles

Since this value is less than the structural limit, it is concluded that AVB wear will not violate the structural integrity performance criteria in any of the Unit 2 SGs during the next planned inspection interval. As such, AVB wear will not violate the operational leakage and accident induced leakage performance criteria during the same period. The stated structural limit is based on Regulatory Guide 1.121 requirements which include the effects of non-pressure loads which occur under evaluated accident conditions.

Table 2: Summary of Current OA Predictions

	Assumed BOC Depth	Assumed Growth Rate	Maximum depth (%) Predicted at Next Inspection	Structural Limit
AVB Wear	15% (None Detected)	Growth rate for five cycles going forward: 7%TW/cycle	50%	61%
TSP Wear	26.9% (Based on a conservative Bobbin Probe POD)	Growth rate for five cycles going forward: 4%TW/cycle	46.9%	57%

e. The number and percentage of tubes plugged to date, and the affective plugging percentage in each steam generator,

Table 3: Number of Tubes Plugged to Date

	SG A	SG B	SG C
Prior to 2R26	1	0	7
During 2R26	0	0	0
Total After 2R26	1	0	7
Percentage	0.03	0	0.19
Overall Percentage		0.07	

Since no sleeving has been performed in the NAPS2 SGs, the effective plugging percentage is the same as the actual plugging percentage.

f. The results of any SG secondary side inspections.

Secondary-side visual examinations were performed in all three steam generators. These examinations included:

- Post-sludge lancing visual examination of top-of-tubesheet annulus and no-tube lane to assess as-left material condition and cleanliness, and to identify and remove any retrievable foreign objects (FOSAR).
- FOSAR identified and removed two metallic foreign objects from the secondary side of SG-B (see Table 4).
- Sludge lancing removed a total of 51 pounds of deposit material, (15 pounds from SG-A, 18 pounds from SG-B, and 18 pounds from SG-C).
- Steam drum visual inspections to evaluate the material condition and cleanliness of key components such as moisture separators, drain systems, and interior surfaces.
- Ultrasonic thickness readings of selected feedring locations.
- Visual examination of the upper tube bundles and AVB supports.

The results of all secondary-side visual examinations performed were satisfactory, with no degradation detected.

Table 4: Foreign Object Summary

SG	Description	2R26 SSI	2R26 ECT	2R26 Final Result
B	Weld wire ~8" long x 1/8" diameter	Initially detected by SSI. Removed.	Affected and Bounding tubes examined. No wear.	Absence of wear confirmed by ECT. Object removed. No integrity threat going forward.
	Thin, metallic scale-like object, Curvature ~1.75" diameter	Initially detected by ECT. Removed.	Affected and Bounding tubes examined. No wear.	Absence of wear confirmed. Object removed. No integrity threat going forward.

Figure 1 – General Arrangement

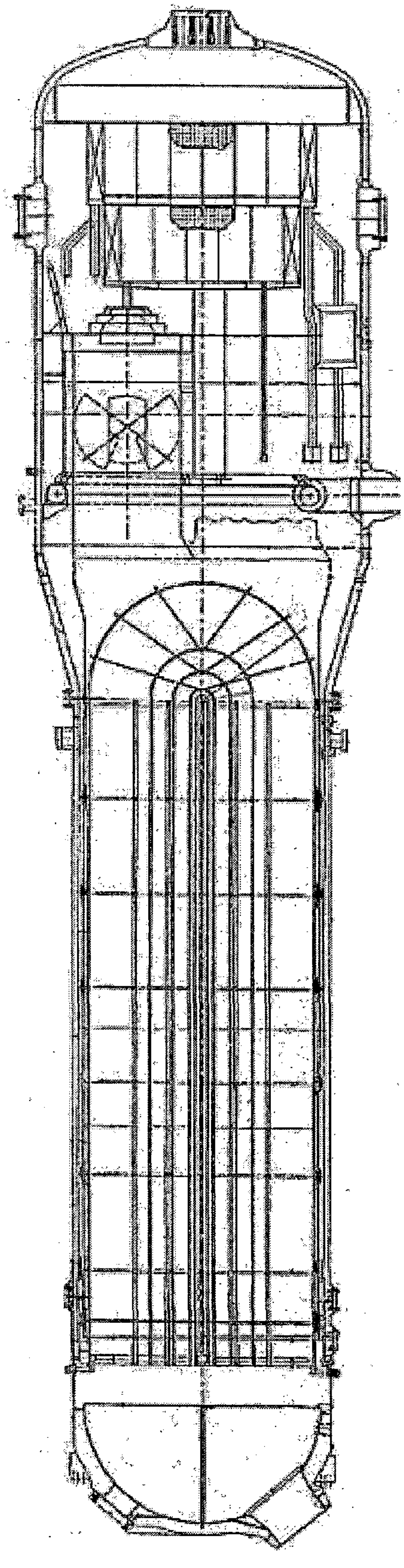


Figure 2 – Disk Stack

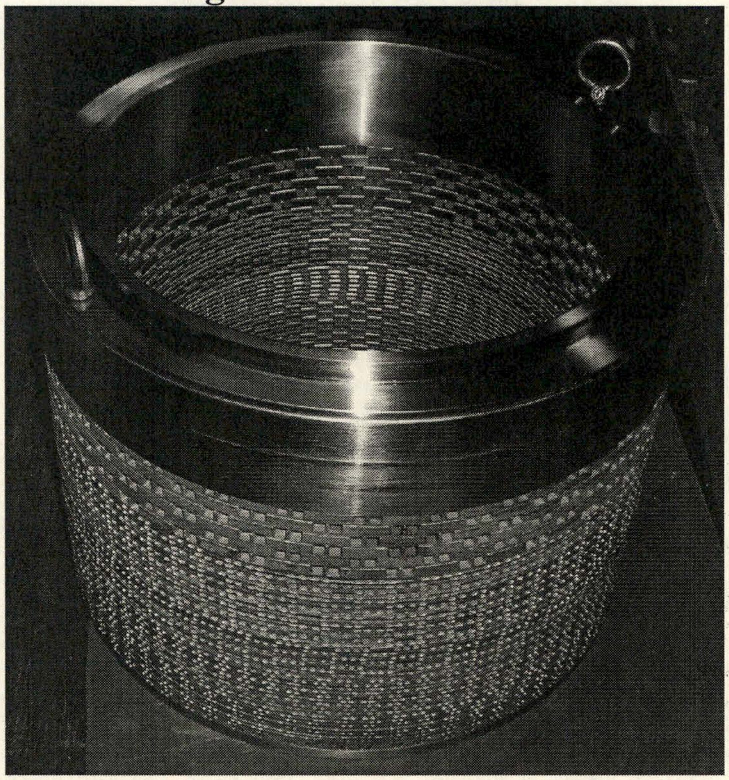
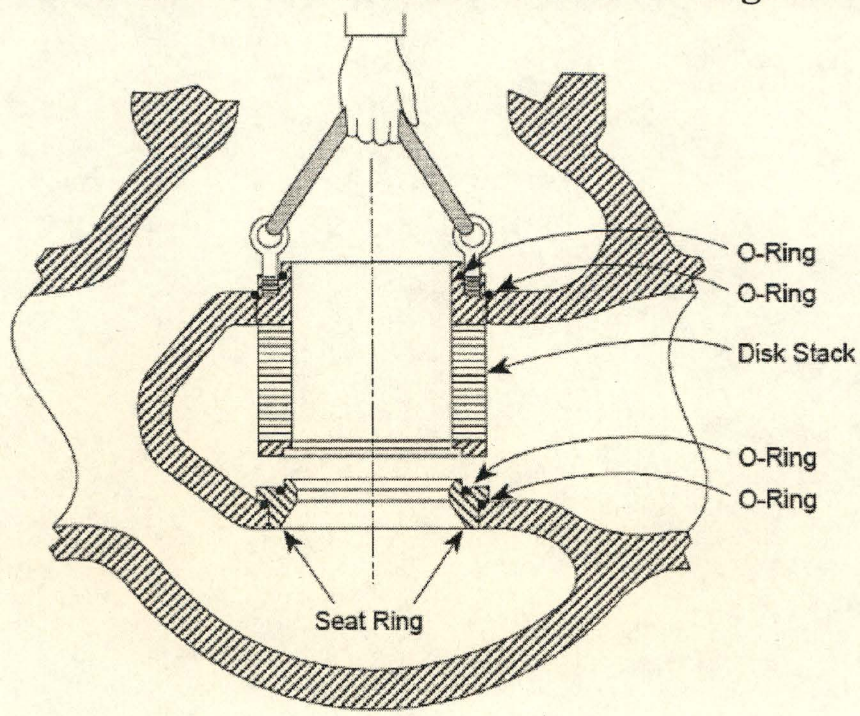


Figure 3 – Disk Stack Location in Feedwater Regulating Valve



Attachment 1

Acronyms

BLG	Bulge
BOC	Beginning of Cycle
CM	Condition Monitoring
CMOA	Condition Monitoring and Operational Assessment
DNG	Ding
DNT	Dent
ECT	Eddy Current Testing
EFPY	Effective Full Power Years
FDB	Flow Distribution Baffle
FOSAR	Foreign Object Search and Retrieval
NAPS	North Anna Power Station
NDE	Non-Destructive Examination
NQH	Non-Quantifiable Historical Indication
NQI	Non-Quantifiable Indication
OXP	Over Expansion
OVR	Over Rolled
PLP	Possible Loose Part
%TW	Percent Through Wall
SG	Steam Generator
SI	Special Interest
SLG	Sludge
SSI	Secondary Side Inspection
TSC	Tube Sheet Cold
TSH	Tube Sheet Hot
TSP	Tube Support Plate