

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

November 19, 2019

10 CFR 50
10 CFR 51
10 CFR 54

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

Serial Nos.: 19-468
NRA/DEA: R0'
Docket Nos.: 50-280/281
License Nos.: DPR-32/37

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION (SPS) UNITS 1 AND 2
SUBSEQUENT LICENSE RENEWAL APPLICATION (SLRA)
SUPPLEMENT TO SUBSEQUENT LICENSE RENEWAL APPLICATION
CHANGE NOTICE 6

On October 31, 2019, Dominion provided Change Notice 5 to the Surry Power Station (SPS) Units 1 and 2 Subsequent License Renewal Application (SLRA) to the NRC (Serial No. 19-438) (ADAMS Accession No. ML19310E716).

On November 7, 2019, in an email from Angela Wu (NRC) to Paul Aitken (Dominion), the NRC provided six comments on Dominion's October 31, 2019 submittal. During a follow-up telecom between Dominion and NRC that same day, it was determined that no action was required on behalf of Dominion for comments 1, 3, and 4.

Subsequently, on November 13, 2019, in an email from Lauren Gibson (NRC) to Paul Aitken (Dominion), the NRC provided three draft RAs (comments 2, 5 and 6 from the email dated November 7, 2019) for which a response was requested on the docket.

Additionally, on October 14, 2019 Dominion submitted letter Serial No. 19-385 which contained four topics that required an SLRA supplement. Change #1 in Enclosure 2 of letter Serial No. 19-385 addressed ASME Code Case N-871 and examination of the accessible surfaces of the carbon fiber reinforced piping (CFRP) lining at the terminal ends. For clarity, it should be noted that the following sentence in Change #1 only applies to the terminal ends and not to the piping:

"Prior to installation of the existing CFRP lining, the exposed metallic substrate was ultrasonically examined to confirm the minimum wall thickness requirements specified in the design documents were met."

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NRR

Change Notice 6, provided in Enclosure 1, includes responses to the three draft RAIs. Enclosure 2 contains SLRA mark-ups that are a result of Change Notice 6, as described in Enclosure 1. This information was previously transmitted in an email from Mark Sartain (Dominion) to Angela Wu (NRC) on November 15, 2019.

If you have any questions or require additional information regarding this submittal, please contact Mr. Paul Aitken at (804) 273-2818.

Sincerely,



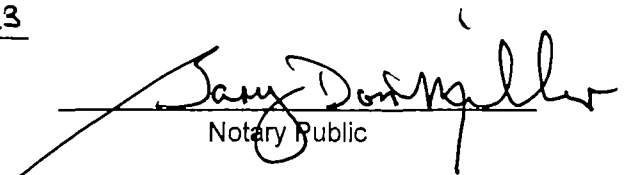
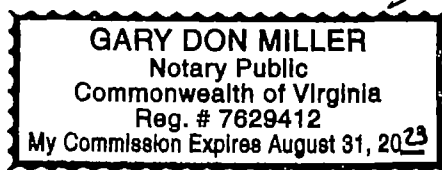
Mark D. Sartain
Vice President - Nuclear Engineering and Fleet Support

COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Mark D. Sartain, who is Vice President - Nuclear Operations and Fleet Support of Virginia Electric and Power Company. He has affirmed before me that he is duly authorized to execute and file the foregoing document in behalf of that Company, and that the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 19th day of November, 2019

My Commission Expires: August 31, 2023



Notary Public

Commitments made in this letter: None

Enclosures:

1. Response to Draft RAIs – Change Notice 6
2. SLRA Mark-ups – Change Notice 6

cc: (w/o Enclosures except *)

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Enclosure 1

RESPONSE TO DRAFT RAIs – CHANGE NOTICE 6

**Virginia Electric and Power Company
(Dominion Energy Virginia or Dominion)
Surry Power Station Units 1 and 2**

Comment #	NRC Comment	Dominion Response
2	<p>Based on discussions with NRC environmental reviewers, the water table can vary by feet at Surry due to tidal fluctuations and seasonal changes. It is unclear why the selection of exploratory hole locations does not take into account the potential for high levels of groundwater.</p>	<p>Dominion will include consideration for seasonal variations to account for high levels of ground water as shown on the attached markup of SLRA page B-157, from Section B2.1.21, Selective Leaching.</p>
5	<p>On its October 31, 2019 letter, the applicant committed to: "Prior to excavation, it shall be confirmed that the south side of the turbine building is not covered with a bitumastic coating below grade."</p> <p>Since the surrogate structure may be coated, it is unclear why additional corrective actions would not also consider more frequent inspections of the concrete CW piping.</p> <p>The commitment should clearly reflect that the applicant intends to confirm that the below grade concrete surface of the turbine building is bare concrete absent of any sort of material covering its surface and is equivalent to the CW piping concrete surface.</p> <p>Neither the staff nor applicant know whether the below grade concrete of the turbine building has any sort of water-resistant coating, membrane, or other material covering its surface and therefore rendering the concrete to not be equally exposed to the ground water environment that the CW piping bare concrete is.</p> <p>The staff notes that if there's any type of material covering the concrete surface of the turbine building then the applicant can no longer claim that the turbine building concrete/environment is equivalent to that of the CW piping and therefore should</p>	<p>Dominion has revised the indicated commitment to reflect that the south side of the Turbine Building be confirmed to be bare concrete below grade prior to excavation.</p> <p>Bare concrete below grade will confirm that there is no material of any type covering the concrete surface of the Turbine Building; therefore, the Turbine Building concrete/environment is equivalent to that of the CW piping.</p> <p>Markups for SLRA Table A4.0-1, Item 11 and excerpts from SLRA Sections B2.1.21 and B2.1.27 that reflect the above change are attached.</p>

	proceed only to inspect the CW piping instead of a surrogate turbine building structure.	
6	<p>SLRA Section B2.1.27, Enhancement No. 8 states in part “[i]f a coating is identified, then: Excavation of one 96” CW pipe will be performed to inspect a surface area of 50 square-ft located below groundwater level.”</p> <p>Clarification only: Is the intent to use GALL-SLR Report AMP XI.M41 acceptance criteria and corrective actions if the surrogate structure is coated and the concrete CW pipe is inspected?</p>	<p>If the Turbine Building is determined to not be bare, GALL-SLR Report AMP XI.M41 acceptance criteria and corrective actions will be used for the 96” CW pipe that is excavated for inspection.</p>

Enclosure 2

SLRA MARK-UPS – CHANGE NOTICE 6

**Virginia Electric and Power Company
(Dominion Energy Virginia or Dominion)
Surry Power Station Units 1 and 2**

Table A4.0-1 Subsequent License Renewal Commitments

#	Program	Commitment	AMP	Implementation
27	Buried and Underground Piping and Tanks program	<p>8. <u>Procedure(s) will be developed to perform a one-time inspection (one excavation) for evidence of concrete aging (below grade) associated with either the Unit 1 or Unit 2 High Level Intake Structures, or the south side of the Turbine Building, with the following requirements: (Revised - Change Notice 5) (Revised - Change Notice 6)</u></p> <p>a. <u>Prior to excavation, it shall be confirmed that the south side of the Turbine Building is not covered with a bitumastic coating bare concrete below grade.</u></p> <p>b. <u>If a coating is not identified bare concrete is confirmed, then:</u></p> <ul style="list-style-type: none"> <u>or the Fire Pump House A minimum of 50 ft² concrete surface area below the frost level groundwater level will be inspected by the one-time inspection.</u> <u>The procedure will require that, as a surrogate location, the evaluation of the one-time inspection results also shall include evaluation of the acceptability of the eight inaccessible 96-inch CW pipes located between the High Level Intake Structures and the Turbine Building using the guidance in ACI 349.3R.</u> <u>If observed age-related degradation exceeds ACI 349.3R Tier-1 criteria, then the area containing the degradation will be evaluated for acceptability by a responsible Civil Engineer using the Corrective Action Program. The evaluation shall include the acceptability of the eight inaccessible 96-inch CW pipes located between the High Level Intake Structures and the Turbine Building using the guidance in ACI 349.3R.</u> <u>If observed age-related degradation exceeds ACI 349.3R Tier-1 criteria, a subsequent inspection will be performed within ten years to determine if the previously observed degradation remains within the parameters evaluated during the previous inspection. If the degradation during the subsequent inspection more than marginally exceeds the evaluated parameters from the previous inspection, then within five years an excavation of one 96-inch CW pipe will be performed to inspect a surface area of 50 ft² located below groundwater level.</u> <p>c. <u>If a coating is identified bare concrete is not confirmed, then:</u></p> <ul style="list-style-type: none"> <u>Excavation of one 96-inch CW pipe will be performed to inspect a surface area of 50 ft² located below groundwater level.</u> 	B2.1.27	<p>Program will be implemented and inspections begin 10 years before the subsequent period of extended operation. Inspections that are to be completed prior to the subsequent period of extended operation are completed 6 months prior to the subsequent period of extended operation or no later than the last refueling outage prior to the subsequent period of extended operation.</p>

equalize total run times among the diesels, so as to equalize wear and aging. Operating experience for each unit demonstrates no significant difference in aging effects of systems in the scope of this program between the two units.

Inspections will be performed by personnel qualified in accordance with procedures and programs to perform the specified task. Inspections within the scope of the ASME Code will follow procedures consistent with the ASME Code. Non-ASME Code inspection procedures will include requirements for items such as lighting, distance, offset, and surface conditions.

Inspection results will be evaluated against acceptance criteria to confirm that the sampling bases (e.g., selection, size, frequency) will maintain the components' intended functions throughout the subsequent period of extended operation based on the projected rate and extent of degradation. The acceptance criteria are:

- For copper-based alloys, no noticeable change in color from the normal yellow color to the reddish copper color or green copper oxide,
- For gray cast iron and ductile iron, the absence of a surface layer that can be easily removed by chipping or scraping or identified in the destructive examinations,
- The presence of no more than a superficial layer of dealloying, as determined by removal of the dealloyed material by mechanical removal, and
- The components meet system design requirements such as minimum wall thickness, when extended to the end of the subsequent period of extended operation.

When the acceptance criteria are not met such that it is determined that the affected component should be replaced prior to the end of the subsequent period of extended operation, additional inspections will be performed. If subsequent inspections do not meet acceptance criteria, an extent of condition and extent of cause analysis will be conducted to determine the further extent of inspections. Extent of condition and extent of cause analysis will include evaluation of difficult-to-access surfaces if unacceptable inspection findings occur within the same material and environment population. The timing of the additional inspections is based on the severity of the degradation identified and is commensurate with the potential for loss of intended function.

The *Selective Leaching* program (B2.1.21) will be augmented to include a requirement to dig exploratory holes to confirm the presence of groundwater around the buried fire water main loop piping, excavate/examine to identify selective leaching, project any identified degradation, and determine necessary future inspections based on the following:

Exploratory Holes for Groundwater

- A minimum of 25 exploratory holes will be drilled prior to the subsequent period of extended operation (SPEO) and during each 10 year inspection interval in the SPEO to identify suspected system leakage or elevated groundwater. The selection of exploratory hole

sample locations will take into account recent soil sample results, piping most susceptible to aging based on time-in-service, and the severity of piping operating conditions (including considerations for seasonal variations) (Revised - Change Notice 6).

- Exploratory holes will be drilled in areas of suspected system leakage or elevated groundwater.
- Exploratory holes will be drilled to the maximum depth of the fire protection loop piping.
- When water is detected, as a minimum it will be analyzed for pH, chlorides and sulfates.
- Fire protection loop piping will be excavated and inspected at each hole where groundwater has been confirmed and corrective actions implemented based on the inspection results. Each excavation will also include a soil sample, in accordance with the Buried and Underground Piping and Tanks program (B2.1.27) that will be analyzed and the results evaluated with the excavation inspection results.

Corrective Actions for Presence of Groundwater

- If water in an exploratory hole is identified to be a result of fire protection system leakage or other plant system leakage and not due to elevated groundwater, then corrective actions consistent with the *Selective Leaching* program (B2.1.21) will be initiated.
- If water in an exploratory hole is identified to be a result of elevated groundwater, then five additional exploratory holes will be drilled to confirm the extent of the elevated groundwater area. If the additional exploratory holes discover groundwater, an extent of condition analysis will be conducted to determine the extent of additional drillings required. Fire protection loop piping at the additional exploratory holes with groundwater will be excavated for examination.
- If no additional areas of elevated groundwater are identified beyond the area initially confirmed to have elevated groundwater during July 2019 or during the first SPEO 10-year exploratory hole sample location inspections, an extent of condition analysis will be conducted to determine the extent of excavations required for the first and second SPEO inspection intervals. The extent of condition analysis will take into account corrective actions (e.g., piping replacement) and inspection projections conducted for the initial area of confirmed elevated groundwater (which occurred in July 2019.)

Sample Expansion (Selective Leaching due to Elevated Groundwater)

- For each excavation, a minimum of ten feet of buried fire protection main loop piping will be excavated, cleaned using aggressive cleaning techniques sufficient to remove de-alloyed material and visually examined for evidence of selective leaching.
- A minimum of five destructive exams will be performed in separate one foot sample sections of fire protection pipe that exhibit signs of selective leaching.
- Acceptance criteria will be consistent with the Selective Leaching program (B2.1.21).
- An extent of condition analysis will be conducted to determine extent of further inspections.

Change Notice 6

2. (Completed Change Notice 2)

3. Procedures will be revised to obtain pipe-to-soil potential measurements for piping in the scope of SLR during the next soil survey within 10 years prior to entering the subsequent period of operation. (Added - Set 1 RAIs)

Preventive Actions (Element 2) and Detection of Aging Effects (Element 4)

4. Procedures will be revised to require uncoated buried stainless steel tubing segments in the fuel oil system be inspected prior to the subsequent period of extended operation. After inspection, each uncoated stainless steel segment will be coated consistent with Table 1 of NACE SP0169-2007, "Control of External Corrosion on Underground or Submerged Metallic Piping Systems" (Added - Set 1 RAIs) (Revised - Set 3 RAIs)
5. A cathodic protection system will be installed for protection of the 24-inch service water piping at the Low Level Intake Structure five years before entering the subsequent period of operation. (Added - Set 3 RAIs)
6. A cathodic protection system will be installed for protection of each unit's buried carbon steel condensate system and auxiliary feedwater system piping from the emergency condensate storage tank and the emergency condensate makeup tank to the service building five years before entering the subsequent period of operation. (Added - Change Notice 4)

Parameters Monitored/Inspected (Element 3)

7. Procedures will be enhanced to perform two soil corrosivity samples: one adjacent to the Unit 1 circulating water inlet piping and another adjacent to the Unit 2 circulating water inlet piping. Sampling will be performed on a ten year interval. Data collected at each location will include: soil resistivity, soil consortia (bacteria), pH, moisture, chlorides, sulfates, and redox potential. In addition to evaluating each individual parameter, corrosivity of carbon steel reinforcement and concrete degradation in high sulfate, high chlorides and acidic environments will be evaluated. (Added - Change Notice 5)

Detection of Aging Effects (Element 4)

8. Procedure(s) will be developed to perform a one-time inspection (one excavation) for evidence of concrete aging (below grade) associated with the south side of the Turbine Building with the following requirements: (Revised - Change Notice 5) (Revised - Change Notice 6)
- a. Prior to excavation, it shall be confirmed that the south side of the Turbine Building is ~~not covered with a bitumastic coating~~ bare concrete below grade.

b. If ~~a coating is not identified~~ bare concrete is confirmed, then:

- A minimum of 50 ft² concrete surface area below groundwater level will be inspected by the one-time inspection.
- The evaluation of the one-time inspection results shall include evaluation of the acceptability of the eight inaccessible 96-inch CW pipes located between the High Level Intake Structures and the Turbine Building using the guidance in ACI 349.3R.
- If observed age-related degradation exceeds ACI 349.3R Tier-1 criteria, then the area containing the degradation will be evaluated for acceptability by a responsible Civil Engineer using the Corrective Action Program. The evaluation shall include the acceptability of the eight inaccessible 96-inch CW pipes located between the High Level Intake Structures and the Turbine Building using the guidance in ACI 349.3R.
- If observed age-related degradation exceeds ACI 349.3R Tier-1 criteria, a subsequent inspection will be performed within ten years to determine if the previously observed degradation remains within the parameters evaluated during the previous inspection. If the degradation during the subsequent inspection more than marginally exceeds the evaluated parameters from the previous inspection, then within 5 years an excavation of one 96" CW pipe will be performed to inspect a surface area of 50 ft² located below groundwater level. (Added - Change Notice 4)

c. If ~~a coating is identified~~ bare concrete is not confirmed, then:

- Excavation of one 96" CW pipe will be performed to inspect a surface area of 50 ft² located below groundwater level.

Acceptance Criteria (Element 6)

9. Procedures will be revised to specify that cathodic protection surveys use the -850mV polarized potential, instant off criterion specified in NACE SP0169-2007 for steel piping acceptance criteria unless a suitable alternative polarization criteria can be demonstrated. Alternatives will include the -100mV polarization criteria, -750mV criterion (soil resistivity is less than 100,000 ohm-cm), -650mV criterion (soil resistivity is greater than 100,000 ohm-cm), or verification of less than 1 mpy loss of material rate.

The external loss of material rate is verified:

- Every year when verifying the effectiveness of the cathodic protection system by measuring the loss of material rate.
- Every 2 years when using the 100 mV minimum polarization.
- Every 5 years when using the -750 or -650 criteria associated with higher resistivity soils. The soil resistivity is verified every 5 years.