VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

June 2, 2022

10 CFR 50.90

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Serial No.: 22-144
NRA/GDM: R1
Docket Nos.: 50-280/281
License Nos.: DPR-32/37

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNITS 1 AND 2
PROPOSED LICENSE AMENDMENT REQUEST (LAR)
REMOVAL OF REFUELING WATER CHEMICAL ADDITION TANK AND REPLACEMENT OF CONTAINMENT SUMP BUFFER
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

By letter dated September 30, 2021 (ADAMS Accession No. ML21277A065), Virginia Electric and Power Company (Dominion Energy Virginia) submitted an LAR for Surry Power Station (SPS) Units 1 and 2 to eliminate the Refueling Water Chemical Addition Tank and allow the use of sodium tetraborate decahydrate (NaTB) to replace sodium hydroxide (NaOH) as a chemical additive (buffer) for containment sump pH control following a loss-of-coolant accident (LOCA). By letter dated November 29, 2021 (ADAMS Accession No. ML21334A169), Dominion Energy Virginia submitted supplemental information in support of the LAR.

On April 19, 2022, the NRC provided a request for additional information (RAI) to facilitate their review of the LAR (ADAMS Accession No. ML22110A205). Dominion Energy Virginia's response to the NRC RAI is provided in the attachment. The additional information does not affect the conclusions of the significant hazards consideration determination or the environmental assessment included in the September 30, 2021 LAR.

Should you have any questions or require additional information, please contact Mr. Gary D. Miller at (804) 273-2771.

Respectfully,

Douglas C. Lawrence
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 Mr. Douglas C. Lawrence, who is Vice President – Nuclear Engineering 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 2nd day of June, 2022.

My Commission Expires: August 31, 2023.

GARY DON MILLER
Notary Public
Commonwealth of Virginia
Reg. # 7629412
My Commission Expires August 31, 2023

Notary Public

Commitments contained in this letter: None

Attachment: Response to NRC Request for Additional Information

cc: U.S. Nuclear Regulatory Commission – Region II
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NRC Senior Resident Inspector
Surry Power Station

State Health Commissioner
Virginia Department of Health
James Madison Building – 7th floor
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Richmond, VA 23219

Attachment

RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION

Proposed License Amendment Request

Removal of Refueling Water Chemical Addition Tank and Replacement of Containment Sump Buffer

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

RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION

License Amendment Request - Removal of Refueling Water Chemical Addition Tank and Replacement of Containment Sump Buffer

Surry Power Station Units 1 and 2

BACKGROUND

By letter dated September 30, 2021 [Agencywide Documents Access and Management System (ADAMS) Accession No. ML21277A065], Virginia Electric and Power Company (Dominion Energy Virginia) submitted a License Amendment Request (LAR) to eliminate the Refueling Water Chemical Addition Tank (CAT) and allow the use of sodium tetraborate decahydrate (NaTB) to replace sodium hydroxide (NaOH) as a chemical additive (buffer) for containment sump pH control following a loss-of-coolant accident (LOCA) at Surry Units 1 and 2. By letter dated November 29, 2021 (ADAMS Accession No. ML21334A169), Dominion Energy Virginia submitted supplemental information.

Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," Appendix A, "General Design Criteria for Nuclear Power Plants," General Design Criterion (GDC) 4, "Environmental and Dynamic Effects Design Bases," requires, in part, that structures, systems, and components (SSCs) important to safety be designed to accommodate the effects of postulated accidents, including appropriate protection against the dynamic effects of postulated pipe ruptures.

Meeting the intent for compliance with GDC 4 requires that nuclear power plant SSCs important to safety be designed to accommodate the effects of, and be compatible with, the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including loss-of-coolant accidents. These SSCs shall be protected against certain dynamic effects, including pipe-whipping and discharging fluids. Such dynamic effects may be excluded from the design basis when analyses reviewed and approved by the Commission demonstrate that the probability of pipe rupture is shown to be extremely low under conditions consistent with the design basis for piping. Additionally, NUREG-0800 Standard Review Plan section 3.6.2 addresses Determination of Rupture locations and Dynamic Effects Associated with the postulated Rupture of Piping for piping inside containment, for piping outside containment and Branch Technical Position (BTP) 3-3 addresses Protection against Postulated Piping Failures in Fluid Systems Outside Containment, and BTP 3-4 discusses Postulated Rupture Locations in Fluid System Piping Inside and Outside Containment.

To complete its review, the NRC staff requested additional information (RAI) as detailed below.

EMIB-RAI-1:

Section 3.2.1 of the attachment 1 of the LAR addresses NaTB Basket design. It is stated that the basket locations are selected such that they are not adversely impacted by the effects of the High Energy Line Break (HELB) jet impingement forces and pipe whip due to being sufficiently protected through the use of barriers, restraints, and distance. In order to understand that these baskets in Unit 1 and Unit 2 containments procured as safety related components are protected from HELB effects, the NRC staff requests a summary table for the 7 baskets listing the Unit number and the basket number, and the specific HELB effects protection method employed, namely (i) the distance or Zone of Influence (ZOI) method, (ii) restraints method, (iii) isolation or barriers method, or (iv) combination method.

Dominion Energy Response:

The HELB effects protection methods employed for the seven (7) NaTB baskets for Surry Power Station (SPS) Units 1 and 2 are provided in Tables 1 and 2, respectively. These protection methods were determined based on drawing reviews and Unit 1 and Unit 2 Containment walkdowns.

Table 1 – Unit 1 NaTB Basket HELB Protection Methods

Unit	NaTB Basket Number	HELB Protection Method
1	01-RS-BSKT-1	Combination (Barrier and Distance)
1	01-RS-BSKT-2	Combination (Barrier and Distance)
1	01-RS-BSKT-3	Combination (Barrier and Distance)
1	01-RS-BSKT-4	Combination (Barrier and Distance)
1	01-RS-BSKT-5	Combination (Barrier and Distance)
1	01-RS-BSKT-6	Combination (Barrier and Distance)
1	01-RS-BSKT-7	Combination (Barrier and Distance)

Table 2 – Unit 2 NaTB Basket HELB Protection Methods		
Unit	**NaTB Basket Number**	**HELB Protection Method**
2	02-RS-BSKT-1	Combination (Barrier and Distance)
2	02-RS-BSKT-2	Combination (Barrier and Distance)
2	02-RS-BSKT-3	Combination (Barrier and Distance)
2	02-RS-BSKT-4	Combination (Barrier and Distance)
2	02-RS-BSKT-5	Combination (Barrier and Distance)
2	02-RS-BSKT-6	Combination (Barrier and Distance)
2	02-RS-BSKT-7	Combination (Barrier and Distance)

The majority of the piping inside Containment classified as high energy is located within the steam generator cubicles and pressurizer room. The seven (7) baskets for each unit are located in the Containment basement (El. -27'-7") and are thereby protected by the concrete floor at elevation (-)3'-6". In addition, the baskets located in the Containment annulus area are protected by the crane wall, and the baskets located adjacent to the Incore Instrumentation Tunnel (IIT) are protected by the IIT wall. [Reference Figures 1 and 2 provided in Dominion Energy Virginia's letter dated November 29, 2021 (ADAMS Accession No. ML21334A169.)]

Portions of the pressurizer spray lines are routed to the ceiling area of the (-)27'-7" elevation and are restrained to limit pipe whip. All of the baskets are located such that impingement pressure from a HELB would not affect the ability of the NaTB buffer to perform its design function based on the zone of influence (ZOI) radius. Additionally, the jet force from a HELB would impact various equipment and structural supports, which would tend to break up the jet and dissipate its energy before contacting the baskets.

It should be noted that the NaTB baskets are procured as non-safety related and classified as non-safety related with quality requirements (NSQ) since they are designed to meet seismic II/I and structural integrity requirements. The justification for this designation was provided in the response to NRC Request No. 11 in the supplemental LAR information provided in Dominion Energy Virginia's letter dated November 29, 2021 (ADAMS Accession No. ML21334A169). The NaTB chemical is procured and classified as safety-related.

EMIB-RAI-2:

In Section 3.2.2 of attachment 1 and the configurations of the containment spray system current and as-modified in attachment 2 of the LAR, it is shown that the piping from Chemical Addition Tank (CAT) are disconnected from the containment spray suction header piping. As a result of this change, the NRC staff requests additional information regarding the piping interface stress qualification where piping from Chemical Addition Tank (CAT) was disconnected. The disconnected piping from CAT and its supports in the vicinity of the interface that provided continuity and support to containment spray suction header interface, no longer provide any support after the modification. Please discuss the following.

(i) Address if any new supports or revisions to the existing supports on the containment spray header suction piping in the vicinity of interface are needed.

(ii) Address any impact on the stress qualification of containment spray suction header piping.

(iii) Also, address whether the containment spray header suction piping is a High Energy line, and any HELB locations for this piping are affected.

Dominion Energy Response:

(i) The cutting and capping of the caustic addition piping at the connection to the containment spray (CS) pump suction piping does not affect the existing stress analysis of the CS pump suction piping because the caustic addition piping is modeled as being decoupled from the CS pump suction piping. Therefore, no new supports or revisions to existing supports on the CS suction piping are needed.

(ii) As noted in the response to (i) above, the cutting and capping of the caustic addition piping at the connection to the CS pump suction piping does not affect the existing stress analysis of the CS pump suction piping. All the stresses remain within allowable stress limits with the modified configuration of the piping.

(iii) High Energy lines are defined as lines for which the maximum operating pressure exceeds 275 psig or the maximum operating temperature equals or exceeds 200°F. The CS piping design pressure and temperature do not meet these criteria; therefore, no HELB locations for this piping were affected.