UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 26, 2022

Mr. Daniel G. Stoddard
Senior Vice President and
Chief Nuclear Officer
Innsbrook Technical Center
5000 Dominion Blvd.
Glen Allen, VA 23060-6711

SUBJECT: SURRY POWER STATION, UNITS 1 AND 2 – ISSUANCE OF AMENDMENT NOS. 308 AND 308, RE: LICENSE AMENDMENT REQUEST TO REMOVE THE REFUELING WATER CHEMICAL ADDITION TANK AND CHANGE THE CONTAINMENT SUMP PH BUFFER (EPID: L-2021-LLA-0179)

Dear Mr. Stoddard:

The U.S. Nuclear Regulatory Commission (NRC, the Commission) has issued the enclosed Amendment No. 308 to Subsequent Renewed Facility Operating License No. DPR-32 and Amendment No. 308 to Subsequent Renewed Facility Operating License No. DPR-37 for the Surry Power Station (Surry), Units 1 and 2, respectively. The amendments revise the technical specifications in response to your application dated September 30, 2021, as supplemented by letters dated November 29, 2021, June 2, 2022, and June 13, 2022.

These amendments revise Technical Specification Section 3.4.A.4, “Spray Systems” to eliminate the Refueling Water Chemical Addition Tank and allow the use of sodium tetraborate decahydrate to replace sodium hydroxide as a chemical additive (buffer) for containment sump pH control following a loss-of-coolant accident at Surry, Units 1 and 2. This change will also eliminate active components from the Containment Spray system.

A copy of the Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's monthly *Federal Register* notice.

Sincerely,

/RA/

Zackary R. Stone, Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-280 and 50-281

Enclosures:
1. Amendment No. 308 to DPR-32
2. Amendment No. 308 to DPR-37
3. Safety Evaluation

cc: Listserv

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-280

SURRY POWER STATION, UNIT NO. 1

AMENDMENT TO SUBSEQUENT RENEWED FACILITY OPERATING LICENSE

Amendment No. 308
Subsequent Renewed License
No. DPR-32

1. The Nuclear Regulatory Commission (NRC, the Commission) has found that:

   A. The application for amendment by Virginia Electric and Power Company (the licensee) dated September 30, 2021, as supplemented by letters dated November 29, 2021, June 2, 2022, and June 13, 2022, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B of the Subsequent Renewed Facility Operating License No. DPR-32 is hereby amended to read as follows:

(B) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 308, are hereby incorporated in the renewed license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented by the completion of the Unit 1 fall 2022 refueling outage.

FOR THE NUCLEAR REGULATORY COMMISSION

Shawn A. Williams

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Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to Subsequent Renewed Facility
Operating License No. DPR-32
and Technical Specifications

Date of Issuance: August 26, 2022

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-281

SURRY POWER STATION, UNIT NO. 2

AMENDMENT TO SUBSEQUENT RENEWED FACILITY OPERATING LICENSE

Amendment No. 308
Subsequent Renewed License
No. DPR-37

1. The Nuclear Regulatory Commission (NRC, the Commission) has found that:

   A. The application for amendment by Virginia Electric and Power Company (the licensee) dated September 30, 2021, as supplemented by letters dated November 29, 2021, June 2, 2022, and June 13, 2022, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B of the Subsequent Renewed Facility Operating License No. DPR-37 is hereby amended to read as follows:

(B) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 308, are hereby incorporated in the renewed license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented by the completion of the Unit 2 spring 2023 refueling outage.

FOR THE NUCLEAR REGULATORY COMMISSION

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Date: 2022.08.26 12:35:38 -04'00'

Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to Subsequent Renewed Facility
Operating License No. DPR-37
and Technical Specifications

Date of Issuance : August 26, 2022

ATTACHMENT

SURRY POWER STATION, UNIT NOS. 1 AND 2

TO LICENSE AMENDMENT NO. 308

SUBSEQUENT RENEWED FACILITY OPERATING LICENSE NO. DPR-32

DOCKET NO. 50-280

AND

TO LICENSE AMENDMENT NO. 308

SUBSEQUENT RENEWED FACILITY OPERATING LICENSE NO. DPR-37

DOCKET NO. 50-281

Replace the following pages of the Subsequent Renewed Facility Operating Licenses and the Appendix A Technical Specifications (TSs) with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove Pages	Insert Pages
License	License
License No. DPR-32, Page 3	License No. DPR-32, Page 3
License No. DPR-37, Page 3	License No. DPR-37, Page 3
TSs	TSs
3.4-1	3.4-1
4.1-9b	4.1-9b
4.1-10	4.1-10

3. This subsequent renewed license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations: 10 CFR Part 20, Section 30.34 of 10 CFR Part 30, Section 40.41 of 10 CFR Part 40, Sections 50.54 and 50.59 of 10 CFR Part 50, and Section 70.32 of 10 CFR Part 70; and is subject to all applicable provisions of the Act and the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified below:

   A. Maximum Power Level

      The licensee is authorized to operate the facility at steady state reactor core power levels not in excess of 2587 megawatts (thermal).

   B. Technical Specifications

      The Technical Specifications contained in Appendix A, as revised through Amendment No. 308 are hereby incorporated in the renewed license. The licensee shall operate the facility in accordance with the Technical Specifications.

   C. Reports

      The licensee shall make certain reports in accordance with the requirements of the Technical Specifications.

   D. Records

      The licensee shall keep facility operating records in accordance with the requirements of the Technical Specifications.

   E. Deleted by Amendment 65

   F. Deleted by Amendment 71

   G. Deleted by Amendment 227

   H. Deleted by Amendment 227

3. This subsequent renewed license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations: 10 CFR Part 20, Section 30.34 of 10 CFR Part 30, Section 40.41 of 10 CFR Part 40, Sections 50.54 and 50.59 of 10 CFR Part 50, and Section 70.32 of 10 CFR Part 70; and is subject to all applicable provisions of the Act and the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified below:

   A. Maximum Power Level

      The licensee is authorized to operate the facility at steady state reactor core power levels not in excess of 2587 megawatts (thermal).

   B. Technical Specifications

      The Technical Specifications contained in Appendix A, as revised through Amendment No. 308 are hereby incorporated in the renewed license. The licensee shall operate the facility in accordance with the Technical Specifications.

   C. Reports

      The licensee shall make certain reports in accordance with the requirements of the Technical Specifications.

   D. Records

      The licensee shall keep facility operating records in accordance with the requirements of the Technical Specifications.

   E. Deleted by Amendment 54

   F. Deleted by Amendment 59 and Amendment 65

   G. Deleted by Amendment 227

   H. Deleted by Amendment 227

3.4 SPRAY SYSTEMS

Applicability

Applies to the operational status of the Spray Systems.

Objective

To define those limiting conditions for operation of the Spray Systems necessary to assure safe unit operation.

Specification

A. A unit's Reactor Coolant System temperature or pressure shall not be made to exceed 350°F or 450 psig, respectively, unless the following Spray System conditions in the unit are met:

1. Two Containment Spray Subsystems, including containment spray pumps, piping, and valves shall be OPERABLE.

2. Four Recirculation Spray Subsystems, including recirculation spray pumps, coolers, piping, and valves shall be OPERABLE.

3. The refueling water storage tank shall contain at least 387,100 gallons of borated water at a maximum temperature of 45°F. The boron concentration shall be at least 2300 ppm but not greater than 2500 ppm.

4. The sodium tetraborate decahydrate (NaTB) baskets shall be unobstructed, in place, intact, and shall contain at least 10,760 lbm of sodium tetraborate decahydrate collectively. The NaTB in the baskets shall provide adequate pH adjustment of borated water.

5. All valves, piping, and interlocks associated with the above components which are required to operate under accident conditions shall be OPERABLE.

TABLE 4.1-2A
MINIMUM FREQUENCY FOR EQUIPMENT TESTS

	DESCRIPTION	TEST	FREQUENCY	FSAR SECTION REFERENCE
1.	Control Rod Assemblies	Rod drop times of all full length rods at hot conditions	Prior to reactor criticality: a. For all rods following each removal of the reactor vessel head b. For specially affected individual rods following any maintenance on or modification to the control rod drive system which could affect the drop time of those specific rods c. SFCP	7
2.	Control Rod Assemblies	Partial movement of all rods	SFCP	7
3.	Deleted			
4.	Pressurizer Safety Valves	Setpoint	Per the Inservice Testing Program	4
5.	Main Steam Safety Valves	Setpoint	Per the Inservice Testing Program	10
6.	Containment Isolation Trip	* Functional	SFCP	5
7.	Refueling System Interlocks	* Functional	Prior to refueling	9.12
8.	Service Water System	* Functional	SFCP	9.9
9.	Residual Heat Removal System	Functional	Per the Inservice Testing Program	9.3
10.	Deleted			
11.	Diesel Fuel Supply	* Fuel Inventory	SFCP	8.5
12.	Deleted			
13.	Main Steam Line Trip Valves	Functional (Full Closure)	Before each startup (TS 4.7) The provisions of Specification 4.0.4. are not applicable	10

TABLE 4.1-2B
MINIMUM FREQUENCIES FOR SAMPLING TESTS

	DESCRIPTION	TEST	FREQUENCY	UFSAR SECTION REFERENCE
1.	Reactor Coolant Liquid Samples	Radio-Chemical Analysis (1)	SFCP (5)	
		Tritium Activity	SFCP (5)	9.1
		* Chemistry (CL, F & O2)	SFCP (9)	4
		* Boron Concentration	SFCP	9.1
		DOSE EQUIVALENT I-131	SFCP (4)(7)	
		DOSE EQUIVALENT XE-133	SFCP (4)	
2.	Refueling Water Storage	Chemistry (Cl & F)	SFCP	6
3.	Boric Acid Tanks	* Boron Concentration	SFCP	9.1
4.	NaTB Baskets	NaTB Buffer Analysis (2)	SFCP	6
5.	Spent Fuel Pit	* Boron Concentration	SFCP	9.5
6.	Secondary Coolant	DOSE EQUIVALENT I-131	SFCP	
7.	Stack Gas Iodine and Particulate Samples	* I-131 and particulate radioactive releases	SFCP	

* See Specification 4.1.D

SFCP - Surveillance frequencies are specified in the Surveillance Frequency Control Program.

(1) A radiochemical analysis will be made to evaluate the following corrosion products: Cr-51, Fe-59, Mn-54, Co-58, and Co-60.

(2) A laboratory test will be performed to verify that a sample from the NaTB baskets provides adequate pH adjustment of borated water.

UNITED STATES
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WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO

AMENDMENT NO. 308 TO SUBSEQUENT RENEWED FACILITY OPERATING LICENSE NO. DPR-32

AND

AMENDMENT NO. 308 TO SUBSEQUENT RENEWED FACILITY OPERATING LICENSE NO. DPR-37

VIRGINIA ELECTRIC AND POWER COMPANY

SURRY POWER STATION, UNIT NOS. 1 AND 2

DOCKET NOS. 50-280 AND 50-281

1.0 INTRODUCTION

By letter dated September 30, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21277A065), as supplemented by letters dated November 29, 2021 (ML21334A169), June 2, 2022 (ML22153A135), and June 13, 2022 (ML22164A853), Virginia Electric and Power Company (VEPCO, the licensee) submitted a license amendment request (LAR) for changes to the Surry Power Station (Surry), Units 1 and 2, technical specifications (TSs).

The requested changes would revise TS Section 3.4.A.4, “Spray Systems,” Table 4.1-2A, “Minimum Frequency for Equipment Tests,” and Table 4.1-2B, “Minimum Frequencies for Sampling Tests.” These changes would 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. This change will also eliminate the CAT and associated caustic piping and equipment which will be permanently isolated from the Containment Spray (CS) system and removed from the CS system.

The supplements dated June 2 and June 13, 2022, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the U.S. Nuclear Regulatory Commission (NRC) staff’s original proposed no significant hazards consideration determination as published in the *Federal Register* on January 25, 2022 (87 FR 3848).

2.0 REGULATORY EVALUATION

The NRC issued construction permits for Surry, Units 1 and 2, before May 21, 1971. Consequently, Surry, Units 1 and 2, were not subject to the requirements in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," Appendix A, "General Design Criteria [GDC] for Nuclear Power Plants," (see SECY-92-223, "Resolution of Deviations Identified during the Systematic Evaluation Program," (ML003763736) dated September 18, 1992.) The conclusion was that Surry, Units 1 and 2, met the intent of the General Design Criteria (GDC) published in 1967 (draft GDCs).

The regulatory requirements and guidance documents which the NRC staff used in the review of the LAR are listed below:

Regulations

10 CFR 50.36, "Technical specifications," paragraph (c) states, in part, that technical specifications will include "Limiting conditions for operation [LCOs]" and in 10 CFR 50.36(c)(2), states "[l] imiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility."

10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," contains requirements for a system to limit the temperature of the fuel and provide long-term cooling following a LOCA.

10 CFR 50.49, "Environmental qualification of electric equipment important to safety for nuclear power plants," requires, in part, licensees to establish a program for qualifying the electric equipment important to safety defined in 50.49(b). 50.49(e) requires that the electric equipment qualification program must include and be based on the following parameters: temperature and pressure, humidity, chemical effects, radiation, aging, submergence, synergistic effects, and margins.

10 CFR 50.67, "Accident source term," provides, in part, the requirements for evaluation of the consequences of applicable Design Basis Accidents (DBA).

10 CFR 50, Appendix A:

> GDC 1, "Quality standards and records," which states that "Structures, systems, and components important to safety shall be designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety functions to be performed.
>
> GDC 4, "Environmental and dynamic effects design bases" which requires, in pertinent part, that hat 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.
>
> GDC 14, "Reactor coolant pressure boundary [RCPB]," with respect to maintaining assurance of the extremely low probability of abnormal leakage or failure of the RCPB and safety-related structures exposed to containment spray solutions.

GDC 41, “Containment atmosphere cleanup,” states, in part, that systems to control fission products shall be provided as necessary to reduce the concentration of fission products released to the environment following postulated accidents.

Guidance

Regulatory Guide (RG) 1.183, “Alternative Radiological Sources Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors,” Revision 0, dated July 2000, (ML003716792).

NUREG-0800, “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [Light-Water Reactor] Edition,” (SRP) Section 3.11 “Environmental Qualification of Mechanical and Electrical Equipment,” Revision 3, (ML063600397) provides guidance on EQ of mechanical and electrical equipment.

NUREG-0800, Section 3.6.2, “Determination of Rupture Locations and Dynamic Effects Associated with the Postulated Rupture of Piping,” Revision 3, (ML16088A041) addresses determination of rupture locations and dynamic effects associated with the postulated rupture of piping for piping inside containment and for piping outside containment.

NUREG-0800, Section 6.5.2, “Containment Spray as a Fission Product Cleanup System,” Revision 4, (ML070190178).

NUREG-0800, Branch Technical Position (BTP) 3-3, “Protection Against Postulated Piping Failures in Fluid Systems Outside Containment,” Revision 3 (ML070800027).

NUREG-0800, BTP 3-4, “Postulated Rupture Locations in Fluid System Piping Inside and Outside Containment,” Revision 3 (ML16085A315).

NUREG-0800, BTP 6-1, “pH for Emergency Coolant Water for Pressurized Water Reactors,” (ML063190011).

Inspection and Enforcement Bulletin (IEB) 79-01B, “Environmental Qualification of Class 1E Equipment.”

IEEE Standard 323-1974, “IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations.”

3.0 TECHNICAL EVALUATION

3.1 Background

Surry, Units 1 and 2, CAT is used to add NaOH to the CS system and recirculation spray (RS) systems to reduce the amount of radioiodine released during a post-LOCA event. According to the guidance in NUREG-1465, “Accident Source Terms for Light-Water Nuclear Power Plants,” dated February 1995 (ML041040063), iodine released from the damaged core to the containment after a LOCA is composed of 95 percent cesium iodide, which is a highly ionized salt and soluble in water. The function of the NaOH additive is to maintain the pH of the containment sump water in the basic range, which means a pH above 7 at a reference temperature of 25 degrees Centigrade (C) (77 degrees Fahrenheit (F)). A basic pH minimizes the conversion of water-soluble cesium iodine to elemental iodine, which can be re-evolved as a gas into containment and potentially be released to the atmosphere.

The guidance in NUREG/CR-5950, “Iodine Evolution and pH Control,” dated December 1992 (ML063460464), describes acids and bases in containment and their relationship to iodine chemical forms and evolution.

In the LAR, the licensee proposes using baskets of soluble NaTB on the containment lower level basement floor rather than NaOH from an active spray system, to maintain a basic sump pH during a post- LOCA event. The guidance in SRP Section 6.5.2 and RG 1.183, Appendix A, identify a pH of 7 as the value below which molecular iodine should be assumed to evolve from the sump water.

The sump pH buffer affects the type and amounts of chemical precipitates that may form in post-LOCA recirculating water. These chemical precipitates are a result of interaction between materials in containment (e.g., insulation and metallic materials) and the sump fluid, and they could degrade the performance of the emergency core cooling system (ECCS) by contributing to blockage of sump strainers, fuel assemblies, and loss of heat transfer. Studies of these “chemical effects” have included both NaTB and NaOH. WCAP-16530-NP-A, “Evaluation of Post-Accident Chemical Effects in Containment Sump Fluids to Support GSI-191,” dated March 31, 2008 (ML081150379), provides additional references for chemical effects testing and evaluation. In the licensee’s supplemental response, dated February 27, 2009 (ML090641018), to Generic Letter (GL) 2004-02, “Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors,” dated September 13, 2004 (ML042360586), the licensee describes the chemical effects analysis for Surry, Units 1 and 2.

In addition, the pH of the sump fluid may affect corrosion of ECCS components. To reduce the likelihood of stress corrosion cracking (SCC) in austenitic stainless steel, BTP 6-1 provides a minimum pH criterion of 7.0 and states that the likelihood of SCC decreases with increasing pH between 7.0 and 9.5. It also notes that aluminum corrosion and the associated hydrogen gas evolution should be considered for pH greater than 7.5.

3.2 Technical Evaluation Containment Sump pH Buffer Change

3.2.1 Licensee’s Evaluation

In the LAR, the licensee proposes installing seven stainless steel baskets containing NaTB in the floor basement level of containment for adjusting the post LOCA sump pH. LCO 3.4.A.4 would be revised to require the NaTB baskets to be unobstructed, in place, and intact, and to collectively contain at least 10,760 pounds (lbm or 4,885 kg) of NaTB that shall provide adequate pH adjustment of the borated water. The amount of NaTB stored in containment will be greater than the minimum amount specified in the TS. The NRC staff’s audit (ML22089A009) documents that the NaTB amount will be controlled by measurements using a basket fill level, as documented via plant procedures. The existing TS requirement to measure the NaOH concentration in the chemical additive tank would be replaced with a requirement to verify that a sample of the NaTB buffer provides adequate pH adjustment.

SRP Section 6.5.2 states that for long-term iodine retention, the pH of the sump solution should be at least 7.0 at the time of spray recirculation mode onset and remain above 7.0 for 30 days. In the November 29, 2021, supplemental response to NRC request no. 4, the licensee stated that an equilibrium analytical model was used to perform two types of calculations to conclude that the pH will reach 7.0 before the start of sump recirculation and remain above 7.0 over the 30-day post-LOCA period.

This model also demonstrated that the pH will not exceed the upper limit of 9.0 as stated in UFSAR Section 6.2.3.3 (ML21273A295) which identifies a pH range of 7.0 to 9.0 for the recirculating spray fluid. The first type of calculation also determined the amount of NaTB required to reach a pH of 7.0 before the start of sump recirculation and remain at or above 7.0 over the 30-day post-LOCA period. The second type also determined whether the maximum pH of 9.0 would be exceeded for a given amount of NaTB. The model considered the combination of the boron chemical species, the NaTB mass and pH until the boron mass balance and charge balance criteria for equilibrium were satisfied and met the pH limits stated above.

The licensee also stated in its supplement, dated November 29, 2021, that an analysis was performed for both single-train and full engineered safety features conditions using different inputs depending on the type of calculation. The licensee benchmarked the analytical model against pH measurements in laboratory tests with plant-specific conditions. The small underprediction of the measured pH by less than 0.2 units was applied to the pH analyses for the required NaTB quantity and maximum pH. The licensee also performed detailed analyses of the submergence rate of the baskets and laboratory tests to measure the dissolution rate of the specified NaTB, including variability in density and chemistry.

In the LAR, the licensee describes the key inputs and conservative biases considered in the calculations. The NRC staff's audit summary of the LAR describes the borated water sources and the boron concentration ranges considered in the calculations, including the non-boric acids and bases with their sources and references for how they were evaluated (hydrochloric acid, nitric acid, hydriodic acid, cesium hydroxide, and lithium hydroxide). In calculating the amount of hydrochloric acid, the licensee assumed that all containment cable, that is not inside conduit, is chlorine-containing material and that entire mass was included in the calculation using NUREG/CR-5950.

The licensee calculated the amount of NaTB required to meet the pH 7.0 requirement at the start of sump recirculation (68.3 minutes) and at 30 days. The licensee concluded that if the pH 7.0 minimum is met at those times, using conservative amounts of acids and bases, then it would be met for the entire time because of the rapid dissolution of the NaTB buffer compared to the gradual increase of strong acid. To evaluate the maximum pH, the licensee performed the analysis for additional times early in the event because the NaTB dissolves rapidly and strong acids were not included. The licensee concluded that for the full range of quantity and storage configuration evaluated for the NaTB would meet the requirement for a pH of 7.0 by the start of sump recirculation at 68.3 minutes and would maintain the pH between 7.0 and 9.0 for 30 days, with margin. Based on the dissolution analysis and testing, the licensee concluded the NaTB would dissolve in time to meet the pH criteria by a large margin, without exceeding the maximum pH limit.

3.2.2 NRC Staff Evaluation

The NRC staff reviewed the licensee's request to determine if the proposed amount of buffer (NaTB) is sufficient to prevent iodine re-evolution by raising the pH to at least 7.0 prior to the beginning of recirculation and maintaining it above 7.0 for the 30-day post-LOCA period, without causing it to exceed 9.0. To better understand the technical basis of the request, the NRC staff audited the licensee's pH calculation methodology, assumptions, inputs, and calculations (ML22089A009). The NRC staff compared input values to the values in current Surry, Units 1 and 2, licensing basis documents such as the TS (ML052910358 and ML052910360), Units 1 and 2 respectively, and the UFSAR (ML21273A295).

As part of its review, the NRC staff also performed hand calculations related to basket geometry and capacity, pH at the onset of recirculation, pH after 30 days following the postulated LOCA, and the amounts of strong acids (nitric and hydrochloric) generated in the post-LOCA environment.

The NRC staff finds the licensee's borated water volumes, boron concentration values, and other reactor coolant system chemistry input values reasonable because they used ranges specified in the TSs adjusted for measurement uncertainty. The calculation accounted for hold-up sources of water in containment, normal non-borated water in the sump, and the water of hydration in the NaTB. The NRC staff also confirmed the time of recirculation as 68.3 minutes (1.14 hours) from UFSAR Section 14.5.5, "Containment Iodine Removal by Spray System." The NRC staff finds the licensee's calculation of hydrochloric and nitric acids reasonable based on the quantity of source material and the use of relationships in NUREG/CR-5950 for radiation dose and acid generation. The NRC staff also confirmed that the NaTB properties and basket geometry in the licensee's calculations were consistent with manufacturer specifications and the basket drawings. Based on the above NRC staff verification of the licensee's calculation, the NRC staff finds that the licensee's confirmatory testing demonstrated the accuracy of the pH methodology, and that the licensee applied the small difference between predicted and measured values to the proposed buffer quantity.

The NRC staff finds that the form of storage of the NaTB would make it readily available following a LOCA to perform its pH buffering function because the baskets are located on the containment lower level basement where they will be submerged early in the event, and based on the solubility of NaTB at the temperature of the sump fluid. The NRC staff utilized Lange's Handbook of Chemistry (Thirteenth Edition, McGraw-Hill Book Company, New York, NY, p. 4-109, 1985) and the "Borax Decahydrate Product Data Sheet" (U.S. Borax, August 2021, https://www.borax.com/resources/data-sheets/borax-decahydrate) to confirm that the solubility of NaTB will be higher than the available NaTB required by the TS. The NRC staff finds there will be more NaTB quantity available in the baskets at all temperatures due to the solubility characteristics of NaTB. The NRC staff finds that the required NaTB quantity identified in the TS can fully dissolve in the sump fluid with margin. In addition, the NRC staff finds that the licensee's testing and analysis demonstrate the NaTB will dissolve at the rate required, with margin.

The amount of NaTB actually stored in the containment would be greater than the minimum determined from the calculation. During the audit, the licensee explained that the NaTB amount will be controlled via plant procedures and the use of basket fill level instrumentation which will provide measurements of quantity. The quantity of stored NaTB affects the pH calculation. The effect of the fill level on pH also depends on the NaTB properties, such as density and equivalence. The NRC staff's audit confirmed that the licensee's calculation considered the relevant ranges of fill level and NaTB properties in its analyses for meeting the pH criteria.

The NRC staff reviewed the licensee's submittals, the licensee's post-LOCA sump pH calculation, assumptions, and methodology, and finds that the change from NaOH injection to NaTB baskets stored in containment will provide reasonable assurance that the post-LOCA sump pH (at a reference temperature of 25 degrees C) will reach at least 7.0 by the onset of recirculation and maintain this pH for the 30-day post-LOCA period, as discussed in this section of the SE. The NRC staff also performed independent calculations to evaluate the post-LOCA sump pH behavior using the specified amount of NaTB.

The proposed TS requirement to maintain at least 10,760 lbm of NaTB in baskets in containment provides reasonable assurance that a pH of at least 7.0 will be reached by onset of recirculation mode and be maintained for the 30-day period following a DBA LOCA, as discussed above.

3.2.3 NRC Staff Conclusion

Based on its review of the licensee's methodology, inputs, and analyses, the NRC staff concludes that the licensee met the criteria in SRP 6.5.2 and RG 1.183 for maintaining a pH of at least 7.0 (at a reference temperature of 25 degrees C) in the sump fluid from the time of recirculation to 30 days after the start of the postulated LOCA, as discussed above. The NRC staff concludes that the proposed changes meet 10 CFR 50.67 for evaluating DBA consequences and GDC 41 as it relates to pH control for preventing post-LOCA iodine re-evolution, and therefore, finds it acceptable.

3.3 Technical Evaluation ECCS Strainer Blockage

3.3.1 Licensee's Evaluation

The licensee's LAR and its supplements address the effect of the pH buffer change on the potential for ECCS strainer blockage due to formation of chemical precipitates in the sump fluid. The licensee considers the current chemical precipitate evaluation bounding and did not submit a new evaluation for the proposed NaTB buffer. As the licensee described in Section 3.1.3 of the original submittal, this is based on the current chemical effects analysis being attributed mostly to aluminum corrosion, the reduction in the aluminum corrosion for NaTB buffer compared to NaOH in the licensee's chemical effects methodology, the unchanged amount of chemical effects source materials, the absence of additional chemical effects associated specifically with NaTB, and the current margin between the chemical precipitate quantity used in strainer testing and the quantity predicted by the chemical effects methodology. The proposed change would eliminate NaOH from the CS system, which the licensee stated in the original submittal was assumed to have a pH of 10.5 for calculating chemical effects. In addition, the long-term pH with NaTB would be lower in the 7.0-9.0 range than with NaOH, which is less corrosive for aluminum.

3.3.2 NRC Staff Evaluation

The NRC staff evaluated the licensee's existing Surry, Units 1 and 2, chemical effects analysis considering the changes proposed in the LAR. The amount of chemical precipitate in the licensee's analysis is determined primarily by aluminum corrosion (see ML22089A009). The licensee's methodology, which is supported by test results such as those associated with WCAP-16530-NP-A, predicts the aluminum corrosion rate and amount of chemical precipitate would decrease with decreasing pH over the ranges predicted for NaOH and NaTB sump pH buffers. Because the use of NaTB would eliminate NaOH from the CS and reduce the long-term pH of the sump solution, the licensee's proposed changes would result in less aluminum corrosion and therefore less chemical precipitate. In addition, there are no chemical effects specific to NaTB or the stainless steel basket materials. The NRC staff also finds that the change from NaOH to NaTB as the pH buffering agent is acceptable as it relates to post-LOCA generation of chemical precipitates that could contribute to ECCS suction strainer blockage.

3.3.3 NRC Staff Conclusion

Based on these factors, the NRC staff concludes that the licensee's existing chemical effects analysis remains bounding, and that the proposed changes meet 10 CFR 50.46 as it relates to the Surry, Units 1 and 2, chemical effects analysis, and therefore, finds it acceptable. The NRC staff notes that its review of the licensee's GL 2004-02 response for in-vessel effects has not been completed as part of and is not affected by this LAR and its supplements.

3.4 Technical Evaluation Corrosion

3.4.1 Licensee's Evaluation

The licensee addresses the criteria in BTP 6-1, which states that the pH of the recirculating sump solution have a minimum pH of 7.0 to reduce the probability of SCC of austenitic stainless steel components, and that hydrogen generation from aluminum corrosion should be considered if pH is greater than 7.5. In the November 29, 2021, supplemental response to NRC request no. 4, the licensee stated that the proposed amount of NaTB buffer achieves a minimum long-term pH of 7.0 after four hours. The licensee also stated that evaluation of hydrogen generation is not affected because the pH range for the proposed amount of NaTB buffer maintains the pH between 7.0 and 9.0, which is consistent with the current licensing basis.

3.4.2 NRC Staff Evaluation

The NRC staff evaluated if the proposed containment sump pH will be in a range that does not cause SCC of austenitic stainless steel components or an increase in the corrosion rate of aluminum. The licensee's pH calculations and the NRC staff's corresponding evaluation indicate that the post-LOCA sump pH will remain above 7.0 and below 9.0 by the time RS mode is credited for iodine removal at 68.3 minutes.

For austenitic stainless steel, the criteria in the BPT 6-1's guidance are that for a low probability of SCC the pH should be 7.0 or greater and that an increasing pH in the 7.0 to 9.5 range increases the assurance that SCC will not occur. For aluminum, BTP 6-1 includes a criterion that for pH greater than 7.5, hydrogen generation from aluminum corrosion should be considered. In the LAR, the licensee stated that hydrogen generation would be unaffected by the proposed changes because the long-term predicted sump pH range of 7.0-9.0 is unchanged from the current design pH range. The NRC staff noted this is consistent with the pH range described for the recirculating spray solution in UFSAR Section 6.2.3.3, "Chemical Additives." In addition, the post-LOCA pH range is consistent with BTP 6-1 as it relates to limiting the likelihood of SCC of components in containment.

3.4.3 NRC Staff Conclusion

Based on the predicted sump pH being at least 7.0 early in the post-LOCA period, and within the licensee's current analysis range of 7.0-9.0 for 30 days, the NRC staff concludes that the proposed NaTB pH buffer change acceptable with respect to SCC of austenitic stainless steel at lower pH, and corrosion of aluminum at higher pH. The NRC staff concludes that the proposed use of NaTB meets GDC 14, with respect to assuring the low probability of abnormal leakage or failure of the reactor coolant pressure boundary and safety-related structures, and therefore, finds it acceptable.

3.5 Evaluation of TS changes

3.5.1 Licensee's Proposed TS Changes

In TS 3.4.A.4, the licensee proposed to delete the existing requirement related to NaOH and replace it with the following requirement for NaTB:

> The sodium tetraborate decahydrate (NaTB) baskets shall be unobstructed, in place, intact, and shall contain at least 10,760 lbm of sodium tetraborate decahydrate collectively. The NaTB in the baskets shall provide adequate pH adjustment of borated water.

In TS Table 4.1-2A, "Minimum Frequency for Equipment Tests," the licensee proposed to delete the refueling water CAT functional test from the list of required equipment tests.

In TS Table 4.1-2B, "Minimum Frequencies for Sampling Tests," the licensee proposed to replace the test for the NaOH concentration of the chemical additive tank with an NaTB buffer analysis of the NaTB baskets. The proposed change includes a footnote in Table 4.1-2B to define the buffer analysis as follows:

> A laboratory test will be performed to verify that a sample from the NaTB baskets provides adequate pH adjustment of borated water.

3.5.2 NRC Staff Evaluation

The NRC staff reviewed the proposed TS changes to assess whether the TS required amount of NaTB is sufficient to maintain the sump pH at 7.0 or greater during a post-LOCA and that requirements for periodic sampling and testing of the buffer provide reasonable assurance it will function as required.

The NRC staff determined that the proposed changes to TS 3.4.A.4, TS Table 4.1-2A, and TS Table 4.1-2B, are acceptable as NaTB will serve as an adequate buffer for post-LOCA sump pH control, as evaluated above in Section 3.2 of this safety evaluation. Additionally, the NRC staff finds it acceptable to maintain a combined weight of at least 10,760 lbm of NaTB, as this amount of buffer will be adequate to maintain the sump pH greater than 7.0. The proposed changes include required periodic testing of the NaTB stored in containment to confirm the NaTB buffering capabilities are within its design limits.

3.5.3 NRC Staff Conclusion

Based on the above, the NRC concludes the proposed changes meet 10 CFR 50.36 with respect to incorporating the use of NaTB into the TS, and therefore, finds it acceptable.

3.6 Technical Evaluation of NaTB baskets from High Energy Line Breaks (HELB) effects

3.6.1 Licensee's Evaluation

The licensee's LAR proposes the addition of seven NaTB baskets inside containment and cutting and capping the caustic chemical addition piping at the connection to the containment spray pump suction piping located outside of containment.

The licensee's initial submittal states that the NaTB baskets are procured as non-safety related and classified as non-safety related with quality requirements and are designed to meet seismic II / I and structural integrity requirements.

3.6.2 NRC Staff Evaluation

The NRC staff reviewed protection of the NaTB baskets from the effects of HELBs to ensure the baskets would perform their function following a LOCA. The licensee's LAR stated that the HELB protection method employed for the NaTB baskets is a combination of barriers, restraints and distance. Barriers, walls and floors, isolate the NaTB baskets from high energy lines, and distance method is created by keeping an adequate distance beyond the zone of influence from high energy lines.

In its supplement dated June 2, 2022, the licensee stated, as part of the response to EMIB-RAI-1, that the majority of the high energy piping inside containment is located within the steam generator cubicles and pressurizer room. The seven baskets for each unit are located in the containment basement elevation -27'-7" and are protected by the concrete floor at elevation -3'-6". 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. 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 radius. Beyond the zone of influence the jet force from a HELB diminishes and dissipates its energy before reaching the baskets.

3.6.3 NRC Staff Conclusion

Based on the above HELB protection information, the NRC staff concludes that the request meets the acceptance criteria in BTP 3-4 and NUREG-0800, SRP 3.6.2. Therefore, the NRC staff concludes that the NaTB baskets are adequately protected from HELB effects and is compliant with the requirements of GDC 4 and therefore, finds it acceptable.

3.7 Technical Evaluation of Containment Spray Header Piping Stresses

3.7.1 Licensee's Evaluation

In its LAR, the licensee proposes to modify the caustic addition piping outside containment by cutting and capping it at the connection to the CS pump suction piping. The CS system pump suction piping design pressure and temperature do not meet the criteria to be classified as high energy line piping because those parameters are less than the classification of high energy piping outside of containment per BTP 3-3. This classification is also reflected in the high energy piping, at Surry, Units 1 and 2, which is defined as piping with a maximum operating pressure exceeding 275 pounds per square inch gage or the maximum operating temperature exceeding 200°F. Therefore, HELB consideration is not needed for CS pump suction piping.

The licensee also stated that the existing stress analysis of seismic class 1 CS system pump suction piping is not affected 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, and the stresses remain within allowable stress limits for the modified configuration of the piping.

3.7.2 NRC Staff Evaluation

The NRC staff reviewed the modifications to the safety-related piping systems. Based on the November 29, 2021, NRC request no. 12, the NRC staff finds that NaTB baskets are adequately protected from jet impingement, pipe whip, and HELB effects as they are located in the containment lower level basement whereas the major source of high energy piping is located elsewhere in the plant in the steam generator cubicles and the pressurizer room, the NRC staff finds that the containment spray header piping stresses remain within allowable stress limits for the modified configuration because the cut and capped modified section are modeled as being decoupled form the CS pump piping section, and all the stresses remain within allowable stress limits with the modified configuration of the piping.

3.7.3 NRC Staff Conclusion

Based on the above, the NRC staff concludes that the acceptance criteria in BTP 3-3 and NUREG 0800, SRP 3.6.2 continues to be met. The NRC staff concludes that the modified, final configuration of the CS system associated with this LAR retains its compliance with the requirements of GDC 4, and therefore, finds it acceptable.

3.8 Technical Evaluation of the NaTB basket Structure for Seismic and Stress

3.8.1 Licensee's Evaluation

In the LAR and supplements, the licensee stated the following concerning the NaTB baskets relative to information related to seismic and stress considerations:

1. Seven (7) stainless steel baskets will be installed in each of the Surry, Unit 1 and Unit 2 Containments and will contain the required amount of NaTB chemical.
2. The baskets use a fine mesh supported by a perforated plate to contain the NaTB chemical that allows the containment sump water to passively dissolve the NaTB. The perforated plate and fine mesh system encompass four basket side walls and the basket bottom. Each basket will have nominal dimensions of 6' x 5' x 1.5'. The weight of one filled NaTB basket is approximately 3,975 lbs., and the weight of one fully assembled empty NaTB basket is approximately 1,425 lbs.
3. The basket members and connections are analyzed to meet applicable licensing and design basis requirements in the UFSAR [Section 15.2.4, "Seismic Design"] and Dominion Energy Nuclear Engineering Standard (DNES) DNES-STD-CE-0046, [American Institute of Steel Construction (AISC)] 9th Edition, "Manual of Steel Construction."
4. The design loads for the baskets were generated by combining the unfactored load effects of dead loading, chemical pressure loading, and seismic loading. The NaTB baskets were evaluated to maintain their structural integrity during a Design Basis Earthquake (DBE) event concurrent with post-LOCA elevated temperature conditions. Additionally, consideration was given for thermal expansion with the basket design.
5. A failure mode and effects analysis was performed to demonstrate credible failure of the basket does not impede the NaTB buffering agent from performing its design function. [T]he baskets are classified as Non-safety Quality (NSQ).
6. The baskets will be installed on the (-)27'-7" elevation of the Surry Unit 1 and Unit 2 Containments near the annulus, as well as near the Incore Instrumentation Room.

3.8.2 NRC Staff Evaluation

In addition to the review of the licensee's submittal, the NRC staff performed an audit on the licensee's design of the basket (see ML22089A009).

The following discussion provides the NRC staff's review of the licensee's NaTB basket structure for seismic and stress:

1. The NaTB chemical is in powder form and has a consistency like cement or sugar. The active pressure from the powder NaTB on the wall of the basket is a triangular shape of distribution with the maximum pressure at the bottom of the basket tapering up to zero at the top of the basket. The licensee assumed a uniform (rectangular) shape of pressure distribution on the wall of the basket from the bottom to the top. The NRC staff considers this assumption to be conservative because the use of a larger shape (rectangle) versus a smaller (triangular) shape more evenly distributes the chemical's total pressure or force per unit area more evenly on the wall panel.
2. The licensee used the peak acceleration of the post-LOCA event at Elevation -5' of the containment area as seismic loading on the basket while the baskets are actually located at -27'-7" of the containment. The NRC staff considers that the licensee's use of seismic forces on the baskets are conservative because the actual seismic force at the level lower than -5' would be smaller than the seismic force at -5'.
3. The basket is anchored to the concrete floor with angles that have slotted holes. These slotted holes provide allowance for expansion or movement during thermal expansion of the baskets. The basket is unrestrained at the top of the basket and thus will not generate thermal stress as a result of restraints. The maximum temperature of the borated water within the containment basement post-LOCA is 280°F. Therefore, the NRC staff considers that the nonrestrictive design of the baskets would generate insignificant amount of thermal stress in the baskets.
4. The licensee used the computer code, STAAD.Pro, to perform the analysis of combined loading of dead weight of the baskets, the NaTB weight and pressure on walls, and the seismic loading on the basket. The NRC staff finds that the STAAD.Pro computer code is an acceptable code for use in this application because it functions to calculate acceptance criteria data (force and stresses) subject to the 9th Edition of the AISC "Manual of Steel Construction". The licensee designed the basket components to the 9th Edition of the AISC "Manual of Steel Construction," which is a quality, consensus standard commensurate with the importance of the safety functions to be performed by the basket. The NRC staff finds the licensee's use of the STAAD.Pro code for analysis, and the AISC 9th Edition, "Manual of Steel Construction" for design acceptable, because the acceptance criteria within this design code document the safety functions subject to GDC 1.
5. The licensee considered the full combination of applicable loads (i.e., dead load, chemical pressure load, and seismic load) in the analysis of the baskets.

Based on the above evaluation, the NRC staff finds that the licensee has properly used load combinations of the weight of the basket, the NaTB chemical weight and pressure loading on basket walls, and seismic loading as input to the STAAD.Pro computer code to obtain forces (or stresses) in the components (or members) of the basket and design the components to sustain the forces (or stress) consistent with the criteria of the AISC 9th Edition, "Manual of Steel Construction."

3.8.3 NRC Staff Conclusion

The NRC staff concludes that the licensee's NaTB basket design is in compliance with GDC 1 and therefore, finds it acceptable.

3.9 Technical Evaluation of Environmental Qualification for Components in Containment

3.9.1 Licensee's Evaluation

Section 3.1.6, "Environmental Qualification (EQ) of Equipment," in the submittal, dated September 30, 2021, provides the licensee's evaluation on the impact of the proposed changes on the electrical equipment subject to 10 CFR 50.49. The proposed change of eliminating the CAT to allow the use of NaTB to replace NaOH as a chemical additive (buffer) for containment sump pH control following a LOCA would result in a change in the chemical environmental parameters of the electrical equipment subject to 10 CFR 50.49. Currently, the containment spray solution is alkaline due to the direct addition of NaOH to the borated solution from the refueling water storage tank (RWST). According to the licensee, equipment in the Surry, Units 1 and 2, EQ Program was qualified using a chemical spray with a pH range of 8.5 to 10.5 for the first 4 hours and a pH range of 7.0 to 9.0 from 4 hours to 120 days. The changes proposed by this LAR would result in the containment spray solution during the injection mode being acidic, consisting of the borated solution from the RWST only.

In the submittal, dated September 30, 2021, the licensee stated that the "components in containment subject to the EQ Program have been identified and evaluated for the effects of a spray with a pH ranging from 4.0 to 9.0 for the first 4 hours and a pH range of 7.0 to 10.5 from 4 hours to 120 days." According to the licensee, a "pH of 10.5 was used for the equipment qualification in order to retain the qualification at the existing high end of the pH range."

The licensee's evaluations relied upon available industry and technical/research data regarding the chemical resistance of materials for acidic and alkaline sprays, as well as the corrosion rate from the spray composition for the enclosures that house part of the equipment. The licensee considered the chemical resistance of organic materials, the corrosive effects of metallic materials exposed to the spray, and the duration of the initial acidic spray follow by the longer-term alkaline spray. The licensee also evaluated the physical installation to determine which parts of the component would be subjected to direct spray. The licensee credited housing and conduit for protection against chemical spray. The licensee's evaluations concluded that EQ equipment located in the containment remains qualified for the altered containment and recirculation sprays without the need for additional protection from spray.

3.9.2 NRC Staff Evaluation

The NRC staff also evaluated the proposed changes to determine if the licensee evaluated other environmental parameters such as temperature, pressure, and radiation as required under 10 CFR 50.49(e). In the supplement, dated June 13, 2022, the licensee stated that EQ temperature and pressure profiles fully bound the most limiting containment temperature and pressure results due to a large break loss of coolant accident (LBLOCA), small break LOCA (SBLOCA), and main steam line break (MSLB) containment analyses. The licensee also noted that no change to the containment analysis was needed as a result of the proposed changes.

The licensee also evaluated the effects of the proposed change on containment pressure and radiation. In Section 3.2.1, “NaTB Basket Design,” of the submittal, dated September 30, 2021, the licensee states that the “proposed change will not affect the calculated post-accident Containment peak pressure or the Containment pressure profile.” With regards to effects of the proposed change on the radiation environment, the licensee stated that the revised pH is sufficient to achieve long-term retention of iodine by the containment sump fluid for the purpose of reducing accident-related radiation dose following a LOCA. Furthermore, since the amended TS would achieve a sump pH of 7.0 or greater using NaTB, dose related safety margins would not be altered by this amendment.

The licensee’s analysis also considered the chemical resistance of materials when determining susceptibility to acidic and alkaline sprays, including the corrosion rate for enclosures housing parts of equipment, for the required durations following a LOCA. The licensee also confirmed in its supplement, dated June 13, 2022, that the parameters of temperature and pressure for EQ of equipment were not affected because of the proposed changes.

3.9.3 NRC Staff Conclusion

Based on the above, the NRC staff concludes that the licensee has adequately evaluated the impact of the proposed changes to chemical effects, temperature, pressure, and radiation on the EQ of electrical equipment. Therefore, the NRC staff concludes that the proposed changes do not alter the conditions of Surry, Units 1 and 2, EQ Program and continue to meet IEB 79-01B; IEEE Standard 323-1974; and NUREG-0800, Section 3.11. The NRC staff concludes that the proposed amendment is in compliance with 10 CFR 50.49, and therefore, finds it acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission’s regulations, the Commonwealth of Virginia’s State official was notified of the proposed issuance of the amendments on July 29, 2022. On July 29, 2022, the State official confirmed that the Commonwealth of Virginia had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and change surveillance requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts and no significant change in the types of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration published in the *Federal Register* on January 25, 2022 (87 FR 3848), and there has been no public comment on such finding. Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

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Date: August 26, 2022

SUBJECT: SURRY POWER STATION, UNITS 1 AND 2 – ISSUANCE OF AMENDMENT NOS. 308 AND 308, RE: LICENSE AMENDMENT REQUEST TO REMOVE THE REFUELING WATER CHEMICAL ADDITION TANK AND CHANGE THE CONTAINMENT SUMP PH BUFFER (EPID: L-2021-LLA-0179) DATED AUGUST 26, 2022

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OFFICE	DEX/ESEB/(A)BC	DEX/ELTB/(A)BC	DNRL/ARCB/BC	DSS/SCPB/BC
NAME	BLehman	SWyman	KHsueh	BWittick
DATE	6/17/2022	7/5/2022	7/20/2022	7/22/2022
OFFICE	DSS/STSB/BC	OGC	DORL/LPL2-1/BC	DORL/LPL2-1/PM
NAME	VCusumano	MWoods	MMarkley (SWilliams for)	ZStone
DATE	7/20/2022	8/24/2022	8/26/2022	8/26/2022

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