Ronald A. Jones
Vice President
New Nuclear Operations

September 8, 2016

NND-16-0363
10 CFR 50.90
10 CFR 52.63

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Virgil C. Summer Nuclear Station (VCSNS) Units 2 & 3
Combined License Nos. NPF-93 and NPF-94
Docket Nos. 52-027 & 52-028

Subject: VCSNS Units 2 & 3 LAR 16-13: Request for License Amendment and Exemption: Fire Pump Head and Diesel Fuel Day Tank Changes

References: 1. ND-16-1174 Southern Nuclear Operating Company Vogtle Electric Generating Plant Units 3 and 4 Request for License Amendment and Exemption: Fire Pump Head and Diesel Fuel Day Tank Changes (Accession Number ML16236A265), Dated August 23, 2016

Pursuant to 10 CFR 52.98(c) and in accordance with 10 CFR 50.90, South Carolina Electric & Gas Company (SCE&G), acting on behalf of itself and The South Carolina Public Service Authority (Santee Cooper), the Licensees for VCSNS Units 2 and 3, requests an amendment to Combined License (COL) Numbers NPF-93 and NPF-94, for VCSNS Units 2 and 3, respectively. The requested amendment includes changes to the Updated Final Safety Analysis Report (UFSAR) in the form of departures from the incorporated plant-specific Design Control Document Tier 2 information and involves related changes to COL Appendix C (and corresponding plant-specific DCD Tier 1) information. Pursuant to the provisions of 10 CFR 52.63(b)(1), an exemption from elements of the design as certified in the 10 CFR Part 52, Appendix D, Design Certification Rule is also requested for the plant-specific Tier 1 material departures.

The proposed changes to COL Appendix C (and corresponding plant-specific DCD Tier 1 and Tier 2 information) involve changes to the required head for the two fire protection system (FPS) fire pumps and to the minimum volume of the diesel-driven fire pump's fuel day tank as described in the design commitment of Inspections, Tests, Analyses, and Acceptance (ITAAC) 2.3.04.08 and 2.3.04.09. This request is identical in technical content to that submitted by Southern Nuclear Operating Company in Reference 1, with the exception that SCE&G has not submitted ITAAC closure notifications for the ITAAC identified above.

Enclosure 1 of this letter provides the description, technical evaluation, regulatory evaluation (including the Significant Hazards Consideration determination), and environmental considerations for the proposed changes in this License Amendment Request (LAR).

Enclosure 2 provides the exemption request including background and supporting information.

Enclosure 3 provides markups depicting the requested changes to current licensing basis documents.

SCE&G requests staff review and approval of this license amendment and exemption by February 23, 2017, to support implementation of the changes into licensing basis documents and closure of the affected ITAAC in March 2017. Delayed approval of this request could result in a delay of the installation of the fire pump skid, which is scheduled to be installed in Unit 2 in April 2017. SCE&G expects to implement the proposed amendment (through incorporation into the licensing basis documents; e.g., the UFSAR) within 30 days of the approval of the requested changes.

In accordance with 10 CFR 50.91, SCE&G is notifying the State of South Carolina of this LAR by transmitting a copy of this letter to the designated state official.

Should you have any questions about this letter, please contact April R, Rice, Manager, Nuclear Licensing, by telephone at (803) 941-9858, or by email at april.rice@scana.com.

This letter contains no regulatory commitments.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 8th day of September, 2016.

Sincerely,

Ronald A. Jones
Vice President
New Nuclear Operations

DK/RAJ/dk

Enclosure 1: Request for License Amendment: Fire Pump Head and Diesel Fuel Day Tank Changes (LAR 16-13)

Enclosure 2: Exemption Request: Fire Pump Head and Diesel Fuel Day Tank Changes (LAR 16-13)

Enclosure 3: Proposed Changes to Licensing Basis Documents (LAR 16-13)

cc : Billy Gleaves
Ruth Reyes
Chandu Patel
Paul Kallan
Jennifer Dixon-Herrity
Sam Lee
Shawn Williams
Tom Fredette
Jennifer Uhle
Tomy Nazario
Cathy Haney
Jim Reece
Stephen A. Byrne
Jeffrey B. Archie
Ronald A. Jones
Alvis J. Bynum
Kathryn M. Sutton
April Rice
Nick Kellenberger
Matt Kunkle
Mory Diane
Bryan Barwick
Dean Kersey
Ryder Thompson
Margaret Felkel
Cynthia Lanier
Lisa Spears
Frederick Willis
Neil Haggerty
Pat Young
Ken Langdon
Zach Harper
Brian McIntyre
Brian Bedford
Carl Churchman
Joseph Cole
Chuck Baucom
Lisa Alberghini
Curt Castell
Jeff Hawkins
Susan E. Jenkins
William M. Cherry
Rhonda O'Banion
vcsummer2&3project@westinghouse.com
VCSummerMail@westinghouse.com
DCRM-EDMS@SCANA.COM

Virgil C. Summer Nuclear Station Units 2 & 3

NND-16-0363

Enclosure 1

Request for License Amendment:

Fire Pump Head

And

Diesel Fuel Day Tank Changes

(LAR 16-13)

(Enclosure 1 consists of 15 pages, including this cover page)

Table of Contents

Pursuant to 10 CFR 52.98(c) and in accordance with 10 CFR 50.90, South Carolina Electric & Gas Company, acting on behalf of itself and The South Carolina Public Service Authority (Santee Cooper), the Licensees for Virgil C. Summer Nuclear Station (VCSNS) Units 2 & 3, hereby requests an amendment to Combined License (COL) Nos. NPF-93 and NPF-94 for VCSNS Units 2 and 3, respectively. The amendment involves changes to the required head for the two fire protection system (FPS) fire pumps and to the minimum volume of the diesel-driven fire pump's fuel day tank.

1. SUMMARY DESCRIPTION

Changes to the AP1000 plant configuration and analyses have resulted in the need to revise the design of the FPS, including the FPS fire pumps. The heights of three turbine building elevations were increased by three feet at each level and additional platforms were added above the operating deck by a previous design change and the associated license amendment. The upper-most heater bay platform was subsequently elevated by a separate design and licensing basis change. Another design activity involved the incorporation of a beyond design basis requirement to provide an FPS allowance of 800 gallons per minute (gpm) of FPS water to be supplied to the spent fuel pool cooling system (SFS) for cooling, heat removal, and inventory make-up. As a result of these design changes, the capacity of each of the two fire pumps (one motor-driven pump and one diesel-driven pump) is proposed to be increased to provide fire suppression water to the automatic sprinklers and fire protection standpipes at the increased elevations in the turbine building. Additionally, as a result of the increased head requirement of the diesel-driven fire pump and the corresponding horsepower increase for the diesel engine powering this fire pump, the diesel fuel consumption is also increased. Therefore, the fire pump diesel fuel day tank volume credited in the licensing basis is proposed to be increased to support the FPS diesel-driven fire pump horsepower/capacity.

The proposed change revises Tier 2 information in UFSAR Table 9.5.1-2 and Table 14.3-4 to specify the head required for the two fire pumps and COL Appendix C (and plant-specific Tier 1) Section 2.3.4 and Table 2.3.4-2, to verify that each fire pump provides the required flow of at least 2000 gpm at the revised minimum total head of 350 feet (ft.). The proposed change also revises Tier 2 information regarding the minimum fuel day tank capacity to 385 gallons in UFSAR Table 9.5.1-2 and COL Appendix C (and plant-specific Tier 1) Section 2.3.4 and Table 2.3.4-2.

The requested amendment requires changes to UFSAR Tier 2 information, which involve changes to COL Appendix C, and corresponding changes to plant-specific DCD Tier 1 information. This enclosure requests approval of the license amendment necessary to implement the Tier 2 changes and associated COL Appendix C changes. Enclosure 2 requests the exemption necessary to implement the involved changes to the plant-specific DCD Tier 1 information.

2. DETAILED DESCRIPTION

As described in UFSAR Subsection 9.5.1, the FPS performs the nonsafety-related functions of detecting and suppressing fires in the plant. The FPS consists of a number of fire detection and suppression subsystems, referred to as systems, including:

- Detection systems for early detection and notification of a fire
- A water supply system including the fire pumps, yard main, and interior distribution piping
- Fixed automatic fire suppression (i.e., sprinkler) systems
- Manual fire suppression systems and equipment, including hydrants, standpipes, hose stations and portable fire extinguishers

The FPS provides fire protection for the nuclear island (including the containment building, shield building, and auxiliary building), the annex building, the turbine building, the radwaste building and the diesel generator building. To mitigate the effects of beyond design basis events and severe accidents, the FPS design also performs a nonsafety-related function of supplying water to the containment spray system, passive containment cooling system, spent fuel pool cooling system (SFS) and component cooling water system. The FPS is designed in accordance with Branch Technical Position (BTP) Chemical Engineering Branch (CMEB) 9.5-1, “Guidelines for Fire Protection for Nuclear Power Plants” and the applicable National Fire Protection Association (NFPA) standards referenced in UFSAR Subsection 9.5.5.

The original turbine building design provided insufficient space below the 161'-0" operating deck level to accommodate certain construction, operation, and maintenance activities. To resolve this condition, the floor-to-ceiling height of three floor elevations was increased by 3'-0" at each level (i.e., floor elevation 117'-6" to 120'-6", 135'-3" to 141'-3", and 161'-0" to 170'-0") to provide space for these activities. The licensing basis changes associated with these floor elevation changes were approved as VCSNS Units 2 and 3 Amendment No. 12 [ADAMS Accession No. ML14120A364]. This design change also added an upper heater bay platform at elevation 228'-9" to provide additional space for placement of ancillary equipment. The heater bay platform addition was evaluated by the Licensee in accordance with the change review requirements of 10 CFR Part 52, Appendix D, Section VIII, and determined to not require prior NRC approval (see Revision Notice RN-14-052, as summarized in SCE&G’s Report of 10 CFR 50.59 Changes, Tests and Experiments and 10 CFR 52 Appendix D Departure Report, dated July 28, 2014 [ML14209A077]). The design change that added heater bay platforms at the 196'-3" and 228'-9" elevations of the turbine building necessitated the addition of a sprinkler system and hose stations (standpipe) to these platforms.

A subsequent design activity raised the elevation of the upper-most heater bay platform by two feet from 228'-9" to 230'-9" to accommodate the turbine building design. The heater bay platform elevation change was evaluated by the Licensee in accordance with the change review requirements of 10 CFR Part 52, Appendix D, Section VIII, and determined to not require prior NRC approval (see Revision Notice RN-15-050, as summarized in SCE&G’s Report of 10 CFR 50.59 Changes, Tests and Experiments and 10 CFR 52 Appendix D Departure Report, dated February 1, 2016 [ML16034A199]). The changes to the turbine

building elevations impact the hydraulic requirements for the FPS, as the upper-most turbine building floor elevations represent the most hydraulically demanding flow requirement of any AP1000 building protected by the FPS.

In addition to the turbine building elevation changes, incorporation of the 10 CFR 52.80(d) beyond design basis requirement to provide an alternate, independently powered source of water to the spent fuel pool for cooling, heat removal, and inventory make-up required an additional 800 gpm of FPS water to be supplied to the SFS. To address a specific design basis scenario per the Licensee's approved Mitigative Strategies Description and Plans for addressing Loss of Large Areas of the Plant due to Explosions or Fire, fire water flow is provided from the yard main fire loop to the spent fuel pool spray headers using a portable pump. The portable pump takes suction from a fire hydrant on the south side of the plant (near the radwaste building) and discharges to a fire protection flanged connection in the maintenance floor staging area of the auxiliary building from which it is routed to the SFS east spray header. This design allowance, when added to the existing system requirements of the water-based fire protection systems located in the annex, auxiliary, and radwaste buildings, represents the most hydraulically demanding pressure requirement of any flow circuit provided by the FPS.

The FPS includes an electric motor-driven fire pump, which is the lead pump, and a diesel-driven fire pump, which serves as the standby secondary pump. The fire pumps are currently designed in accordance with NFPA 20, *Standard for the Installation of Stationary Pumps for Fire Protection*, 1999 Edition, to provide fire suppression water flow of 2000 gpm at 300 ft. head, which is confirmed in Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) 2.3.04.08. However, calculations show that the current design of each fire pump is not adequate to meet the increased hydraulic requirements resulting from the increase in turbine building height and SFS flow demands described above. Accordingly, the head requirement of each fire pump must be increased to at least 350 ft. at a rated flow of at least 2000 gpm to provide adequate flow to the fire suppression systems. This corresponding change is also proposed for ITAAC 2.3.04.08.

The increase in fire pump head rating also requires an increase in the horsepower rating of the drivers for the two fire pumps in order to supply the increased head of at least 350 ft. at a flow rate of at least 2000 gpm. Therefore, the horsepower ratings of the drivers for the fire pumps are revised to 300 horsepower (hp) for the electric motor-driven fire pump and 350 hp for the diesel-driven fire pump. The horsepower changes resulting from the increased head requirements do not directly impact licensing basis information but do necessitate a change to the diesel-driven fire pump fuel day tank minimum required capacity as described in the licensing basis and verified by ITAAC 2.3.04.09.

In order to assure the diesel-driven fire pump is available for service upon failure of the electric motor-driven fire pump or a loss of offsite power, a diesel fuel day tank reserved exclusively for the diesel-driven fire pump is provided. In accordance with NFPA 20, Section 8-4.3, the capacity of the diesel-driven fire pump fuel day tank is based on the horsepower of the diesel engine, plus volume for expansion and an internal sump. To satisfy the NFPA 20 requirements, the minimum required capacity for the diesel-driven fire pump fuel day tank is proposed to be increased from 240 gallons to 385 gallons. As described in UFSAR Subsection 9.5.1.2.3, the fuel day tank for the diesel-driven fire pump continues to hold enough fuel to operate the pump for at least eight hours.

The increase in required head of the two fire pumps and the increase in the minimum capacity of the diesel-driven fire pump day tank are required to satisfy the UFSAR requirements regarding FPS design.

Proposed Changes to the Licensing Basis are as follows:

UFSAR changes:

1. UFSAR Tier 2 Table 9.5.1-2 is revised to increase the required head for the two (motor-driven and diesel-driven) fire pumps to approximately 350 ft.

2. UFSAR Tier 2 Table 9.5.1-2 is revised to increase the minimum required capacity of the diesel-driven fire pump day tank to 385 gallons.

3. UFSAR Tier 2 Table 14.3-4 is revised to change the minimum total head of the motor-driven and diesel-driven fire pumps to 350 ft. to conform with the changes to Table 9.5.1-2.

COL Appendix C and Plant-Specific Tier 1 changes:

1. Subsection 2.3.4, Design Description 8, and Table 2.3.4-2, Item 8 (ITAAC 2.3.04.08) are revised to verify that the two fire pumps each provide at least 2000 gpm at the revised total head of at least 350 ft.

2. Subsection 2.3.4, Design Description 9, and Table 2.3.4-2, Item 9 (ITAAC 2.3.04.09) are revised to identify the minimum required capacity of the FPS diesel-driven fire pump day tank as 385 gallons.

3. TECHNICAL EVALUATION

The fire water supply system is designed in accordance with BTP CMEB 9.5-1 and the applicable NFPA standards. The proposed changes to the FPS fire pumps and diesel fuel day tank maintain compliance with the codes and standards referenced in UFSAR Subsection 9.5.1.2 by specifying a fire pump rating that meets the system demand requirements of UFSAR Subsection 9.5.1.2.1.3 and the fire pump design requirements of NFPA 20.

Fire Pump Design Approach

The FPS design includes an electric motor-driven fire pump (MP-01A) and diesel engine-driven fire pump (MP-01B), which supply flow to the automatic sprinkler and water spray systems, standpipe systems, fire hydrants and other plant systems for beyond design basis/severe accident mitigation, within the protected area. The two fire pumps are sized to satisfy the most limiting suppression system demands and provide sufficient pressure to overcome pressure drop/head loss in the system. This is accomplished using a pump design methodology that bounds all FPS demands and is consistent with NFPA 20 requirements, as per UFSAR Subsection 9.5.1.2.3, which includes the following requirements:

a. In accordance with NFPA 804, *Standard for Fire Protection for Advanced Light Water Reactor Electric Generating Plants*, 2001 Edition, the pumps are designed to provide the largest expected fire water flow rate, based on 500 gpm for manual hose streams plus the largest design demand on any sprinkler or fixed water spray system, with the hydraulically least demanding portion of the fire main loop out of service

   Design calculations demonstrate that the turbine building has the most hydraulically demanding flow requirements of any suppression (automatic sprinkler or fixed water spray) system in the plant design. Accordingly, specifying a fire pump design that meets the hydraulically most demanding flow requirements of the turbine building automatic sprinkler system bounds the flow requirements of any of the other suppression (automatic sprinkler or fixed water spray) systems covered by this design.

   Furthermore, the new turbine building upper heater bays at elevations 196'-3" and 230'-9" require additional FPS suppression coverage (both sprinkler and standpipe). The added elevations create greater pressure demand requirements on the FPS pumps; therefore, these added platforms require the FPS pumps to be designed to produce increased head. The upper-most heater bay of the turbine building (230′-9″ finished platform elevation) is the highest elevation of any suppression system in any building protected by these pumps and the hydraulic requirements of these upper heater bay areas would be accomplished by a fire pump providing at least 315 ft. head.

b. The largest standpipe system demand for a Class III system, is based on the requirements of NFPA 14, *Standard for Installation of Standpipe, Private Hydrant, and Hose Systems*, 2000 Edition, Sections 5-7 and 5-9.1. The FPS must provide a minimum flow rate of 500 gpm for the hydraulically most remote standpipe plus a minimum flow rate of 250 gpm for each additional standpipe, with a total system flow not to exceed 1250 gpm, at a minimum residual pressure of 100 pounds per square inch guage (psig) at the outlet of the hydraulically most remote 2-1/2 inch hose connection and a minimum residual pressure of 65 psig at the outlet of the hydraulically most remote 1-1/2 inch hose connection.

   The revised design calculation demonstrates that the required head to comply with the requirements of NFPA 14 is 315 ft. to address the increased height of the standpipes providing flow to the new heater bay platforms (Elevations 196′-3" and 230'-9") above the turbine building operating deck. This standpipe presents the hydraulically most demanding flow requirement, 315 ft. at 2000 gpm flow, of the FPS, and is bounded by the 350 ft. head at 2000 gpm fire pump demand addressed in requirement “c” below.

c. The largest system pressure demand of other systems supplied by FPS for beyond design basis/severe accident mitigation. Incorporation of the beyond design basis requirement of 10 CFR 52.80(d) involved a revision of the fire protection design calculations to demonstrate the ability of the fire pumps to supply 800 gpm of fire suppression water flow to the SFS, while also supplying the largest sprinkler demand in the auxiliary building, annex building, or radwaste building and supplying 500 gpm to feed fire hoses. The revised FPS calculation demonstrates that the fire pumps satisfy this demand, by providing at least 2000 gpm at a minimum of 350 ft. head to the Annex Building Staging and Storage Room fire suppression system, which is the fire suppression circuit demonstrating the greatest head loss at this flow rate.

Fire Pump Rating based on FPS Piping Design Pressure

The current design requires fire pumps to provide at least 2000 gpm at a minimum of 300 feet of head. The design changes that increased the elevation of the turbine building and added the upper heater bays and the necessary FPS sprinklers and standpipes to the turbine building, together with the change to supply 800 gpm of water to the SFS by incorporating strategies required by 10 CFR 52.80(d), necessitated a redesign of the fire pumps. To establish that the revised design enveloped all FPS demands, the redesign started with the highest pressure the FPS system components could withstand, 250 pounds per square inch (psi), and worked backwards to determine the appropriate fire pump rating. This process included incorporating NFPA requirements, margins, and elevations of other FPS components to determine the maximum allowable fire pump rating for the envelope of 370 ft. head at 2000 gpm while still being bounded by the maximum design pressure of the FPS system piping.

To confirm that all FPS demands fell below this enveloping value, the FPS calculations were reviewed to identify the fire suppression circuit with the greatest head loss. It was identified that the greatest head loss occurs in the annex building storage and staging rooms at the interface between the FPS and SFS systems at the 135'-0″ elevation, and resulted in the required 350 ft. head from the fire pumps. This result indicated that the changes to the turbine building elevation, requiring 315 ft. head at 2000 gpm from the fire pumps, was enveloped by the 350 ft. head required by the annex building due to the 800 gpm flow allowance to the SFS spray header.

ITAAC Acceptance Criterion based on Maximum Head Loss Circuit

The current licensing basis design commitment and acceptance criteria of ITAAC 2.3.04.08, found in COL Appendix C (and plant-specific DCD Tier 1) Table 2.3.4-2, identify that the fire pumps must deliver at least 2000 gpm each at a total head of at least 300 ft. Implementation of changes to elevate the turbine building, add upper heater bays, including the sprinklers and standpipes to the new heater bays, and incorporate additional FPS flow allowance for the SFS spray system to address beyond design basis mitigation strategies require that the ITAAC design commitment and acceptance criteria also be revised for consistency with the increased flow and head requirements.

Comparison of the fire pump standard rating (which was determined by designing these pumps based upon the maximum pressure rating of the FPS piping and components) with the system demand curves that were developed to identify the greatest FPS pressure demand (i.e., the annex building storage and staging area), reveals that a difference of approximately 20 ft of head at 2000 gpm exists as margin between the two design values. Using the aforementioned enveloping design technique, the fire pump rating was determined to be 370 ft. head at 2000 gpm, and the greatest demand of the FPS system design was determined by calculation to be 350 ft. head at 2000 gpm.

Since 350 ft. head at 2000 gpm is the greatest FPS system demand, it is proposed that the revised design commitment and acceptance criteria for ITAAC 2.3.04.08 indicate that the fire pumps provide “at least 2000 gpm each at a total head of at least 350 ft.” Markups of the proposed ITAAC values are provided as an enclosure to this license amendment request.

The diesel-driven fire pump fuel day tank is currently sized per the requirements of UFSAR 9.5.1.2.3 and NFPA 20, which require that the fuel day tank holds a minimum volume of fuel to operate the diesel-driven fire pump for at least 8 hours. The minimum volume criterion for the diesel-driven fire pump fuel day tank assures availability of the diesel-driven fire pump in the event of a loss of offsite power, or the unavailability of the electric motor driven fire pump. The increase in horsepower for the diesel-driven fire pump increases the fuel consumption rate, thereby resulting in an increase in the minimum diesel fuel storage requirement, pursuant to NFPA 20. NFPA 20 requires that the diesel fuel day tank be sized for one gallon of fuel per horsepower (hp) of the diesel-driven fire pump engine, plus 5 percent volume for expansion and 5 percent volume for an internal sump. The increased diesel engine horsepower increases the minimum required capacity for the fire pump diesel fuel day tank to 385 gallons. Since the tank is currently designed with a capacity of 440 gallons, the physical dimensions and footprint of the tank remain unchanged. Based on the manufacturer-provided diesel engine fuel consumption rate of 18.1 gallons per hour at the engine's rated speed, the revised volume of 385 gallons provides greater than 21 hours run time at the rated capacity of 2000 gpm. Because the fuel day tank holds a sufficient amount of fuel to run the diesel-driven fire pump for greater than 21 hours with the proposed increase in the credited volume, the proposed fuel day tank capacity satisfies the UFSAR Subsection 9.5.1.2.3 minimum volume requirement.

The proposed changes do not impact the ability of the FPS to perform the safety-related function of preserving containment integrity by isolation of the FPS line penetrating the containment because FPS piping is designed for the proposed pressure requirements and these changes do not affect the safety-related, seismic Category I design of the containment isolation valves and associated piping for the FPS containment penetrations.

The proposed changes do not have an adverse impact on the ability of the FPS to provide for manual firefighting capability in plant areas containing safety-related equipment in accordance with BTP CMEB 9.5-1, Subsection C.1.c.(3), because they maintain the NFPA 14 minimum flow requirements at the outlets of the most hydraulically remote 1-1/2 inch and 2-1/2 inch hose connections.

This proposed change supports the design function of providing fire suppression water to the automatic sprinkler system and standpipe system in the upper elevations of the turbine building, which are the most limiting hydraulic demand on the FPS. The proposed change also supports the most limiting beyond design function of providing an alternate, independently powered source of water to the SFP for cooling, heat removal, and inventory make-up. Therefore, the proposed changes do not adversely impact the less limiting nonsafety-related containment spray function or the beyond design basis FPS functions associated with the passive containment cooling system or the component cooling water system.

No safety-related structure, system, component (SSC) or function is involved. The proposed change does not involve nor interface with any SSC accident initiator or initiating sequence of events related to the accidents evaluated in the UFSAR. There is no change to any fire barriers as a result of this proposed amendment.

The proposed changes associated with this license amendment request do not adversely affect the containment, control, channeling, monitoring, processing or releasing of

radioactive and non-radioactive materials. The types and quantities of expected effluents are not changed, and no effluent release path is adversely affected by the proposed changes. The proposed change to the fire pump fuel day tank capacity only involves increasing the credited capacity of this tank, without adversely affecting any aspects of compliance with the oil pollution prevention regulations in 40 CFR 112. Specifically, the proposed 385 gallon tank capacity change has no impact on secondary tank capacity to contain the diesel fuel. As the tank dimensions and footprint are not being revised; credit is being taken for existing capacity in the tank design. Therefore, neither radioactive nor non-radioactive material effluents are affected by the proposed changes.

Plant radiation zones (as described in UFSAR Section 12.3), controls under 10 CFR 20, and expected amounts and types of radioactive materials are not affected by the proposed change. Therefore, individual and cumulative radiation exposures do not change.

Summary

The proposed changes comply with the UFSAR referenced codes and standards and supply sufficient water flow (at least 2000 gpm flow at a minimum 350 ft. total head) to adequately assure the greatest suppression system demand and sufficient pressure to overcome pressure drop/head loss in the entire FPS from fire pump to the suppression system. Each fire pump satisfies the maximum demand requirement of the water-based fire suppression system (including automatic sprinklers) and fire protection standpipe requirements and the largest system demand of other systems supplied by FPS for beyond design basis/severe accident mitigation. The proposed minimum quantity of 385 gallons of fuel for the diesel-driven fire pump fuel day tank assures availability of the diesel-driven fire pump for the minimum 8-hour duration in accordance with applicable codes and standards. These changes do not affect the operation of any systems or equipment that initiate an analyzed accident or alter any structures, systems, and component's (SSC's) accident initiator or initiating sequence of events.

4. REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

10 CFR 52.98(f) requires NRC approval for any modification to, addition to, or deletion from the terms and conditions of a Combined License (COL). This activity involves a change to COL Appendix C, and a corresponding change to plant-specific Tier 1, Inspections, Tests, Analyses and Acceptance Criteria information; therefore, this activity requires a proposed amendment to the COL. Accordingly, NRC approval is required prior to making the plant-specific changes in this license amendment request.

10 CFR 52, Appendix D, Section VIII.B.5.a, allows an applicant or licensee who references this appendix to depart from Tier 2 information, without prior NRC approval, unless the proposed departure involves a change to or departure from Tier 1 information, Tier 2* information, or the COL Appendix A (Technical Specifications), or requires a license amendment under paragraphs B.5.b or B.5.c of the section. The proposed change to plant-specific Tier 2 information also involves a change to plant-

specific Tier 1 (and corresponding COL Appendix C) information, thus it requires NRC approval for the Tier 1 and associated Tier 2 departures.

10 CFR 50, Appendix A, General Design Criteria (GDC) for Nuclear Power Plants, Criterion 3 – Fire Protection, requires that fire detection and fighting systems of appropriate capacity and capability shall be provided and designed to minimize the adverse effects of fires on structures, systems, and components important to safety. Structures, systems, and components important to safety shall be designed and located to minimize, consistent with other safety requirements, the probability and effect of fires and explosions. The changes in the minimum head requirements and the volume of the diesel-driven fire pump fuel day tank provide the appropriate fire protection system capacity and capability to minimize the adverse effects of fires. Therefore, the proposed changes comply with the requirements of GDC 3.

4.2 Precedent

No precedent is identified.

4.3 Significant Hazards Consideration Determination

The proposed changes revise UFSAR Tier 2 Table 9.5.1-2 and Table 14.3-4 to specify the head required for the two fire pumps and Combined License (COL) Appendix C (and plant-specific Tier 1) Section 2.3.4 and Table 2.3.4-2 (ITAAC No. 2.3.04.08), to verify the minimum total head for the two fire pumps. The proposed changes also revise the minimum fuel day tank capacity to 385 gallons in UFSAR Tier 2 Table 9.5.1-2 and COL Appendix C (and plant-specific Tier 1) Section 2.3.4 and Table 2.3.4-2 (ITAAC No. 2.3.04.09).

The requested amendment proposes a change to UFSAR Tier 2 information, which involves a change to the COL Appendix C (and plant-specific Tier 1) information.

An evaluation to determine whether or not a significant hazards consideration is involved with the proposed amendment was completed by focusing on the three standards set forth in 10 CFR 50.92, “Issuance of amendment,” as discussed below:

4.3.1 Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No

The increase in head pressure by the proposed change to the fire protection system (FPS) motor-driven and diesel-driven fire pumps maintains compliance with National Fire Protection Association (NFPA) Standard NFPA-14, *Standard for the Installation of Standpipe, Private Hydrants, and Hose Systems*, 2000 Edition, requirements by providing adequate pressure in the standpipe and automatic sprinkler system to maintain the ability to fight and/or contain a postulated fire. The proposed change to the diesel-driven fire pump fuel day tank volume maintains the availability of the diesel-driven fire pump for service upon failure of the electric motor-driven fire pump or a loss of offsite power by providing a fuel day tank that is reserved exclusively for the diesel-driven pump

and meets the minimum capacity requirements of NFPA 20, *Standard for the Installation of Stationary Pumps for Fire Protection*, 1999 Edition. These changes do not affect the operation of any systems or equipment that initiate an analyzed accident or alter any structures, systems, and component's (SSC's) accident initiator or initiating sequence of events.

These changes have no adverse impact on the support, design, or operation of mechanical and fluid systems. The response of systems to postulated accident conditions is not adversely affected by the proposed changes. There is no change to the predicted radioactive releases due to normal operation or postulated accident conditions. Consequently, the plant response to previously evaluated accidents is not impacted, nor does the proposed change create any new accident precursors.

Therefore, the proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.

4.3.2 Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

The proposed changes do not affect the operation of any systems or equipment that may initiate a new or different kind of accident, or alter any SSC such that a new accident initiator or initiating sequence of events is created. The proposed changes to the fire pump performance specifications and fire pump fuel day tank volume do not affect any safety-related equipment, nor do they add any new interface to safety-related SSCs. No system or design function or equipment qualification is affected by this change. The changes do not introduce a new failure mode, malfunction, or sequence of events that could affect safety or safety-related equipment.

Therefore, the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

4.3.3 Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No

The proposed changes maintain compliance with the applicable Codes and Standards, thereby maintaining the margin of safety associated with these SSCs. The proposed changes do not alter any applicable design codes, code compliance, design function, or safety analysis. Consequently, no safety analysis or design basis acceptance limit/criterion is challenged or exceeded by the proposed change, thus the margin of safety is not reduced.

Because no safety analysis or design basis acceptance limit/criterion is challenged or exceeded by these changes, no margin of safety is reduced.

Therefore, the proposed amendment does not involve a significant reduction in a margin of safety.

Based on the above, it is concluded that the proposed amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

4.4 Conclusions

Based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public. The above evaluations demonstrate that the proposed changes can be accommodated without an increase in the probability or consequences of an accident previously evaluated, without creating the possibility of a new or different kind of accident from any accident previously evaluated, and without a significant reduction in a margin of safety. Having arrived at negative declarations with regard to the criteria of 10 CFR 50.92, this assessment determined that the requested amendment does not involve a Significant Hazards Consideration.

5. ENVIRONMENTAL CONSIDERATIONS

The proposed changes would revise the Combined Licenses (COLs) in regard to the two (motor-driven and diesel-driven) fire pumps' minimum total head and the diesel-driven pump fuel day tank volume. The requested amendment requires changes to UFSAR Tier 2 information, which involve changes to COL Appendix C, and corresponding changes to plant-specific DCD Tier 1 information. This enclosure requests approval of the license amendment necessary to implement the COL changes and the involved Tier 2 changes. Enclosure 2 requests the exemption necessary to implement the involved changes to the plant-specific DCD Tier 1 information.

Sections 2 and 3 of this license amendment request provide the details of the proposed changes.

A review has determined that the proposed amendment would change how a requirement is met with respect to the installation or use of a facility component located within the restricted area, as defined in 10 CFR Part 20, or would change an inspection or surveillance requirement. The Licensee has determined that the anticipated construction and operational effects of the proposed amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9), in that:

(i) There is no significant hazards consideration.

As documented in Section 4.3, Significant Hazards Consideration Determination, of this license amendment request, an evaluation was completed to determine whether or not a significant hazards consideration is involved by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment." The Significant Hazards Consideration Determination concluded that (1) the proposed amendment does not involve a significant

increase in the probability or consequences of an accident previously evaluated; (2) the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated; and (3) the proposed amendment does not involve a significant reduction in a margin of safety. Therefore, it is concluded that the proposed amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of "no significant hazards consideration" is justified.

(ii) There is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite.

The requested amendment proposes changes to maintain the diesel-driven fire pump availability for service upon failure of the electric motor-driven fire pump or a loss of offsite power and to comply with NFPA requirements for fire pump fuel day tank capacity. The change is unrelated to any aspect of plant construction or operation that would introduce any change to effluent types (e.g., effluents containing chemicals or biocides, sanitary system effluents, and other effluents), or affect any plant radiological or non-radiological effluent release quantities. The proposed change to the fire pump fuel day tank capacity only involves the credited capacity of this tank, without adversely affecting any aspects of compliance with the oil pollution prevention regulations in 40 CFR 112. Specifically, the proposed 385-gallon tank capacity change has no impact on secondary tank capacity to contain the diesel fuel as the tank dimensions and footprint are not being revised; credit is being taken for existing capacity in the tank design. Furthermore, the proposed change does not affect any effluent release path or diminish the functionality of any design or operational features that are credited with controlling the release of effluents during plant operation. Therefore, it is concluded that the proposed amendment does not involve a significant change in the types or a significant increase in the amounts of any effluents that may be released offsite.

(iii) There is no significant increase in individual or cumulative occupational radiation exposure.

The proposed changes only affect a non-radioactive system and areas of the plant that contain non-radioactive plant systems. Consequently, the proposed changes have no effect on individual or cumulative occupational radiation exposure during plant operation. Therefore, it is concluded that the proposed amendment does not involve a significant increase in individual or cumulative occupational radiation exposure.

Based on the above review of the proposed amendment, it has been determined that there are no anticipated construction and operational effects of the proposed amendment involving (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in the individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore pursuant to 10 CFR 51.22(b), an environmental impact statement or environmental assessment of the requested amendment is not required.

6. REFERENCES

1. Exemption and Amendment No. 12 to Combined Licenses Nos. NPF-93 and NPF-94 for Virgil C. Summer Nuclear Station Units 2 and 3 [ML14120A364]

2. NND-14-0424 Letter from April R. Rice to NRC Document Control Desk, “Report of 10 CFR 50.59 Changes, Tests and Experiments and 10 CFR 52 Appendix D Departure Report,” dated July 28, 2014 [ML14209A077]

3. NND-16-0028 Letter from April R. Rice to NRC Document Control Desk, “Report of 10 CFR 50.59 Changes, Tests and Experiments and 10 CFR 52 Appendix D Departure Report,” dated February 1, 2016 [ML16034A199]

South Carolina Electric & Gas Company

Virgil C. Summer Nuclear Station Units 2 & 3

NND-16-0363

Enclosure 2

Exemption Request Regarding

Fire Pump Head

and

Diesel Fuel Day Tank Changes

(LAR 16-13)

(Enclosure 2 consists of 9 pages, including this cover page)

1.0 PURPOSE

South Carolina Electric & Gas Company (the Licensee) requests a permanent exemption from the provisions of 10 CFR 52, Appendix D, Section III.B, Design Certification Rule for the AP1000 Design, Scope and Contents, to allow a departure from elements of the certification information in Tier 1 of the generic AP1000 Design Control Document (DCD). The regulation, 10 CFR 52, Appendix D, Section III.B, requires an applicant or licensee referencing Appendix D to 10 CFR Part 52 to incorporate by reference and comply with the requirements of Appendix D, including certified information in DCD Tier 1. The Tier 1 information for which a plant-specific departure and exemption is being requested include changes to the minimum total head requirement for the two fire protection system (FPS) fire pumps and to the diesel-driven fire pump fuel day tank minimum capacity.

This request for exemption provides the technical and regulatory basis to demonstrate that 10 CFR 52.63, §52.7, and §50.12 requirements are met and will apply the requirements of 10 CFR 52, Appendix D, Section VIII.A.4 to allow departures from generic Tier 1 information due to proposed changes to the Tier 1 Section 2.3.4 Design Descriptions and associated Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) in Table 2.3.4-2 ITAAC Item 8 for the fire pump total head required for fire pump test and/or analysis and ITAAC Item 9 for diesel-driven fire pump fuel day tank capacity.

2.0 BACKGROUND

The Licensee is the holder of Combined License Nos. NPF-93 and NPF-94, which authorize construction and operation of two Westinghouse Electric Company AP1000 nuclear plants, named Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3, respectively.

Changes are proposed to the design requirements for the FPS fire pumps as a result of previously approved changes to the fire suppression system (including automatic sprinklers and standpipes) for the upper-most turbine building floors and incorporation of a beyond design basis requirement to supply FPS water to the spent fuel pool cooling system (SFS) for cooling, heat removal, and inventory make-up.

The original turbine building design provided insufficient space below the 161'-0" operating deck level to accommodate certain construction, operation, and maintenance activities. To resolve this condition, the floor-to-ceiling height of three floor elevations was increased by 3'-0" at each level (i.e., floor elevation 117'-6" to 120'-6", 135'-3" to 141'-3", and 161'-0" to 170'-0") to provide space for these activities. The licensing basis changes associated with these floor elevation changes were approved as VCSNS Units 2 and 3 Amendment No. 12 [ADAMS Accession No. ML14120A364]. This design change also added an upper heater bay platform at elevation 228'-9" to provide additional space for placement of ancillary equipment. The heater bay platform addition was evaluated by the Licensee in accordance with the change review requirements of 10 CFR Part 52, Appendix D, Section VIII, and determined to not require prior NRC approval (see Revision Notice RN-14-052 as summarized in SCE&G's Report of 10 CFR 50.59 Changes, Tests and Experiments and 10 CFR 52 Appendix D Departure Report, dated July 28, 2014 [ML14209A077]). The design change that added heater bay platforms at the 196'-3" and 228'-9" elevations of the turbine building necessitated the addition of a sprinkler system and hose stations (standpipe) to these platforms.

A subsequent design activity raised the elevation of the upper-most heater bay platform by two feet from 228'-9" to 230'-9" to accommodate the turbine building design. The heater bay platform elevation change was evaluated by the Licensee in accordance with the change review requirements of 10 CFR Part 52, Appendix D, Section VIII, and determined to not require prior NRC approval (see Revision Notice RN-15-050, as summarized in SCE&G's Report of 10 CFR 50.59 Changes, Tests and Experiments and 10 CFR 52 Appendix D Departure Report, dated February 1, 2016 [ML16034A199]). The changes to the turbine building elevations impact the hydraulic requirements for the FPS, as the upper-most turbine building floor elevations represent the most hydraulically demanding flow requirement of any AP1000 building protected by the FPS.

In addition to the turbine building elevation changes, incorporation of the 10 CFR 52.80(d) beyond design basis requirement to provide an alternate, independently powered source of water to the spent fuel pool for cooling, heat removal, and inventory make-up required an additional 800 gpm of FPS water to be supplied to the SFS. To address a specific design basis scenario per the Licensee's approved Mitigative Strategies Description and Plans for addressing Loss of Large Areas of the Plant due to Explosions or Fire, fire water flow is provided from the yard main fire loop to the spent fuel pool spray headers using a portable pump. The portable pump takes suction from a fire hydrant on the south side of the plant (near the radwaste building) and discharges to a fire protection flanged connection in the maintenance floor staging area of the auxiliary building from which it is routed to the SFS east spray header. This design allowance, when added to the existing system requirements of the water-based fire protection systems located in the annex, auxiliary, and radwaste buildings, represents the most hydraulically demanding pressure requirement of any flow circuit provided by the FPS.

The FPS includes an electric motor-driven fire pump, which is the lead pump, and a diesel-driven fire pump, which serves as the standby secondary pump. The fire pumps are currently designed in accordance with NFPA 20, *Standard for the Installation of Stationary Pumps for Fire Protection*, 1999 Edition, to provide fire suppression water flow of 2000 gpm at 300 ft. head, which is confirmed in Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) Item 8 in Tier 1 Table 2.3.4-2. However, calculations show that the current design of each fire pump is not adequate to meet the increased hydraulic requirements resulting from the increase in turbine building height and SFS flow demands described above. Accordingly, the head requirement of each fire pump must be increased to at least 350 ft. at a rated flow of at least 2000 gpm to provide adequate flow to the fire suppression systems. This corresponding change is also proposed for Tier 1 Table 2.3.4-2, Item 8.

The increase in fire pump head rating also requires an increase in the horsepower rating of the drivers for the two fire pumps in order to supply the increased head of at least 350 ft. at a flow rate of at least 2000 gpm. Therefore, the horsepower ratings of the drivers for the fire pumps are revised to 300 horsepower (hp) for the electric motor-driven fire pump and 350 hp for the diesel-driven fire pump. The horsepower changes resulting from the increased head requirements do not directly impact licensing basis information but do necessitate a change to the diesel-driven fire pump fuel day tank minimum required capacity as described in the licensing basis and verified by Tier 1 Table 2.3.4-2, Item 9.

In order to assure the diesel-driven fire pump is available for service upon failure of the electric motor-driven fire pump or a loss of offsite power, a diesel fuel day tank reserved

exclusively for the diesel-driven fire pump is provided. In accordance with NFPA 20, Section 8-4.3, the capacity of the diesel-driven fire pump fuel day tank is based on the horsepower of the diesel engine, plus volume for expansion and an internal sump. To satisfy the NFPA 20 requirements, the minimum required capacity for the diesel-driven fire pump fuel day tank is proposed to be increased from 240 gallons to 385 gallons. As described in UFSAR Subsection 9.5.1.2.3, the fuel day tank for the diesel-driven fire pump continues to hold enough fuel to operate the pump for at least eight hours.

The increase in required head of the two fire pumps and the increase in the minimum capacity of the diesel-driven fire pump day tank are required to satisfy the UFSAR requirements regarding FPS design.

Proposed Departures from Certified Tier 1 Information are as follows:

1. Subsection 2.3.4, Design Description 8, and Table 2.3.4-2, Item 8 are revised to verify that the two fire pumps each provide at least 2000 gpm at the revised total head of at least 350 ft.

2. Subsection 2.3.4, Design Description 9, and Table 2.3.4-2, Item 9 are revised to identify the minimum required capacity of the FPS diesel-driven fire pump day tank as 385 gallons.

3.0 TECHNICAL JUSTIFICATION OF ACCEPTABILITY

Two fire pumps are provided for each nuclear unit that satisfy most limiting suppression system demands and provide sufficient pressure to overcome pressure drop/head loss in the entire fire protection system from fire pump to the suppression system. This is accomplished by providing the fire pumps sized in accordance with the hydraulically most demanding requirements imposed on the FPS by the plant design. The turbine building represents the most hydraulically demanding flow requirements of any suppression system (automatic sprinkler or fixed water spray) or standpipe system in the plant design. The 800 gpm fire water flow allowance to the SFS to satisfy 10 CFR 52.80(d) beyond design basis requirements, when added to the existing system requirements of the water-based fire protection systems located in the annex, auxiliary, and radwaste buildings, represents the most hydraulically demanding pressure requirement of any flow circuit provided by the FPS. To satisfy these flow and head requirements, the proposed change increases the minimum fire pump total head requirement. To accommodate the increased fire pump pressure rating, the size of the drivers for the two fire pumps is also increased, thereby resulting in a consequential increase in the required capacity of the fire pump fuel day tank capacity.

The inspection and/or analysis and corresponding acceptance criterion of Tier 1 Table 2.3.4-2, Item 8 verify that each fire pump satisfies the maximum demand requirement of the water-based fire protection automatic sprinkler system and fire protection standpipe requirements and the largest system demand of other systems supplied by FPS for beyond design basis/severe accident mitigation. Therefore, the proposed change to align the Table 2.3.4-2 Item 8 acceptance criterion with the revised minimum head requirement for the turbine building suppression system has no impact on the ability of the FPS to

provide fire suppression water by verifying that each pump has the capability to meet the calculated hydraulic demand of the FPS design.

The diesel-driven fire pump fuel day tank is sized per the requirements of UFSAR 9.5.1.2.3 and NFPA-20, which require that the fuel day tank holds a minimum volume of fuel to operate the diesel-driven fire pump for at least 8 hours. The inspection and corresponding acceptance criterion of Table 2.3.4-2, Item 9 verify that the capacity of the fire pump fuel day tank satisfies this minimum volume requirement. Therefore, the proposed change to align the Table 2.3.4-2, Item 9 acceptance criterion with the revised volume requirement associated with the increase in horsepower for the diesel-driven fire pump has no adverse impact on the ability of the day tank to assure the availability of the diesel-driven fire pump for the required 8-hour duration.

The proposed changes do not impact the ability of the FPS to perform the safety-related function of preserving containment integrity by isolation of the FPS line penetrating the containment because FPS piping is designed for the proposed pressure requirements and these changes do not affect the safety-related, seismic Category I design of the containment isolation valves and associated piping for the FPS containment penetrations.

The proposed changes do not have an adverse impact on the ability of the FPS to provide for manual fire fighting capability in plant areas containing safety-related equipment in accordance with BTP CMEB 9.5-1, Subsection C.1.c.(3).

Detailed technical justification supporting this request for exemption is provided in Section 3 of the associated License Amendment Request in Enclosure 1 of this letter.

4.0 JUSTIFICATION OF EXEMPTION

10 CFR Part 52, Appendix D, Section VIII.A.4 and 10 CFR 52.63(b)(1) govern the issuance of exemptions from elements of the certified design information for AP1000 nuclear power plants. Since SCE&G has identified changes to the Tier 1 information as discussed in Enclosure 1 of the accompanying License Amendment Request, an exemption from the certified design information in Tier 1 is needed.

10 CFR Part 52, Appendix D, and 10 CFR 50.12, §52.7, and §52.63 state that the NRC may grant exemptions from the requirements of the regulations provided six conditions are met: 1) the exemption is authorized by law [§50.12(a)(1)]; 2) the exemption will not present an undue risk to the health and safety of the public [§50.12(a)(1)]; 3) the exemption is consistent with the common defense and security [§50.12(a)(1)]; 4) special circumstances are present [§50.12(a)(2)]; 5) the special circumstances outweigh any decrease in safety that may result from the reduction in standardization caused by the exemption [§52.63(b)(1)]; and 6) the design change will not result in a significant decrease in the level of safety [Part 52, App. D, VIII.A.4].

The requested exemption satisfies the criteria for granting specific exemptions, as described below.

1. This exemption is authorized by law

The NRC has authority under 10 CFR 52.63, §52.7, and §50.12 to grant exemptions from the requirements of NRC regulations. Specifically, 10 CFR 50.12 and §52.7 state that the NRC may grant exemptions from the requirements of 10 CFR Part 52 upon a

proper showing. No law exists that would preclude the changes covered by this exemption request. Additionally, granting of the proposed exemption does not result in a violation of the Atomic Energy Act of 1954, as amended, or the Commission's regulations.

Accordingly, this requested exemption is "authorized by law," as required by 10 CFR 50.12(a)(1).

2. This exemption will not present an undue risk to the health and safety of the public

The proposed exemption from the requirements of 10 CFR 52, Appendix D, Section III.B would allow changes to elements of the plant-specific Tier 1 DCD to depart from the AP1000 certified (Tier 1) design information. The plant-specific DCD Tier 1 will continue to reflect the approved licensing basis for VCSNS Units 2 and 3, and will maintain a consistent level of detail with that which is currently provided elsewhere in Tier 1 of the DCD. Therefore, the affected plant-specific DCD Tier 1 ITAAC will continue to serve its required purpose.

The proposed change to the acceptance criterion of Table 2.3.4-2, Item 8 verifies that each fire pump will continue to satisfy the revised maximum demand requirement of the water-based fire protection automatic sprinkler system and fire protection standpipe requirements and the largest system demand of other systems supplied by FPS for beyond design basis/severe accident mitigation. The proposed change to the acceptance criterion of Table 2.3.4-2, Item 9 verifies that the fire pump fuel day tank will continue to satisfy the requirement to hold a minimum volume of fuel for the diesel-driven fire pump, as required by NFPA 20 and UFSAR Subsection 9.5.1.2.3.

These proposed ITAAC changes support the design function of the FPS to provide fire suppression water to the automatic sprinkler system and standpipe system in the locations that represent the most limiting demand on the FPS. Furthermore, the proposed changes support implementation of a beyond design basis FPS function to provide an alternate means of water flow to the SFS for cooling and inventory make-up, without adversely impacting the less limiting nonsafety-related containment spray function or the beyond design basis FPS functions associated with the passive containment cooling system or the component cooling water system. Therefore, the proposed change to align the ITAAC acceptance criterion with the revised minimum head requirement has no adverse impact on the ability of the FPS to provide fire suppression water for the minimum required duration by verifying that each pump has the capability to meet the calculated hydraulic flow and pressure demands of the FPS design and verifying that each fire pump fuel day tank has the required capacity.

The proposed changes do not adversely impact the ability of the FPS to perform the safety-related function of preserving containment integrity by isolation of the FPS line penetrating the containment.

The proposed ITAAC changes do not represent any adverse impact to the design function of the FPS and will continue to protect the health and safety of the public in the same manner. The proposed changes to the acceptance criteria for the fire pump flow and day tank capacity requirements do not introduce any new industrial, chemical, or radiological hazards that would represent a public health or safety risk, nor do they modify or remove any design or operational controls or safeguards intended to mitigate any existing on-site hazards. Furthermore, the proposed change would not allow for a

new fission product release path, result in a new fission product barrier failure mode, or create a new sequence of events that would result in fuel cladding failures.

Accordingly, this change does not present an undue risk from any existing or proposed equipment or systems.

Therefore, the requested exemption from 10 CFR 52, Appendix D, Section III.B would not present an undue risk to the health and safety of the public.

3. The exemption is consistent with the common defense and security

The requested exemption from the requirements of 10 CFR 52, Appendix D, Section III.B would allow the licensee to depart from elements of the plant specific DCD Tier 1 design information. The proposed exemption does not alter the design, function, or operation of any structures or plant equipment that is necessary to maintain a safe and secure status of the plant. The proposed exemption has no impact on plant security or safeguards procedures.

Therefore, the requested exemption is consistent with the common defense and security.

4. Special circumstances are present

10 CFR 50.12(a)(2) lists six "special circumstances" for which an exemption may be granted. Pursuant to the regulation, it is necessary for one of these special circumstances to be present in order for the NRC to consider granting an exemption request. The requested exemption meets the special circumstances of 10 CFR 50.12(a)(2)(ii). That subsection defines special circumstances as when "Application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule."

The rule under consideration in this request for exemption is 10 CFR 52, Appendix D, Section III.B, which requires that a licensee referencing the AP1000 Design Certification Rule (10 CFR Part 52, Appendix D) shall incorporate by reference and comply with the requirements of Appendix D, including Tier 1 information. The VCSNS Units 2 and 3 COLs reference the AP1000 Design Certification Rule and incorporate by reference the requirements of 10 CFR Part 52, Appendix D, including Tier 1 information. The underlying purpose of Appendix D, Section III.B is to describe and define the scope and contents of the AP1000 design certification, and to require compliance with the design certification information in Appendix D.

The proposed change would revise the ITAAC acceptance criteria for fire pump head requirements and diesel-driven fire pump fuel day tank minimum capacity requirements.

The proposed plant-specific Tier 1 ITAAC changes, discussed in Section 2.0 of this exemption request, maintain the required design and beyond design basis functions of the FPS by revising the acceptance criteria to align with the revised design requirements associated with changes to the height of the turbine building and beyond design basis requirements associated with 10 CFR 52.80(d). The proposed changes do not affect any function or feature used for the prevention and mitigation of accidents or their safety analyses. No safety-related structure, system, component (SSC) or function is involved. The proposed changes do not involve nor interface with any SSC accident initiator or initiating sequence of events related to the accidents evaluated and therefore do not have an adverse effect on any SSC's design function.

Accordingly, this exemption from the certification information will enable the Licensee to safely construct and operate the AP1000 facility consistent with the design certified by the NRC in 10 CFR 52, Appendix D.

Therefore, special circumstances are present, because application of the current generic certified design information in Tier 1 as required by 10 CFR Part 52, Appendix D, Section III.B, in the particular circumstances discussed in this request is not necessary to achieve the underlying purpose of the rule.

5. The special circumstances outweigh any decrease in safety that may result from the reduction in standardization caused by the exemption.

Based on the nature of the changes to the plant-specific Tier 1 information and the understanding that these changes support the design function of the FPS, including the fire pumps and the fire pump fuel day tank, it is expected that this exemption may be requested by other AP1000 licensees and applicants. However, a review of the reduction in standardization resulting from the departure from the standard DCD determined that even if other AP1000 licensees and applicants do not request this same departure, the special circumstances will continue to outweigh any decrease in safety from the reduction in standardization because the key design functions of the FPS and the FPS equipment associated with this request will continue to be maintained. Furthermore, the justification provided in the license amendment request and this exemption request and the associated licensing basis mark-ups demonstrate that there is a limited change from the standard information provided in the generic AP1000 DCD, which is offset by the special circumstances identified above.

Therefore, the special circumstances associated with the requested exemption outweigh any decrease in safety that may result from the reduction in standardization caused by the exemption.

6. The design change will not result in a significant decrease in the level of safety.

The exemption revises the plant-specific DCD Tier 1 information regarding changes to the fire pumps total head requirement and the diesel-driven fire pump fuel day tank capacity, as discussed in Section 2.0. The changes to the minimum head requirement for the diesel-driven and electric motor-driven fire pumps and to the minimum capacity of the diesel-driven fire pump fuel day tank maintain the ability of the fire pumps to perform their design and beyond design basis functions Because these functions continue to be met, there is no reduction in the level of safety.

5.0 RISK ASSESSMENT

A risk assessment was not determined to be applicable to address the acceptability of this proposal.

6.0 PRECEDENT EXEMPTIONS

None.

7.0 ENVIRONMENTAL CONSIDERATION

The Licensee requests a departure from elements of the certified information in Tier 1 of the generic AP1000 DCD. The Licensee has determined that the proposed departure would require a permanent exemption from the requirements of 10 CFR 52, Appendix D, Section III.B, Design Certification Rule for the AP1000 Design, Scope and Contents, with respect to installation or use of facility components located within the restricted area, as defined in 10 CFR Part 20, or which changes an inspection or a surveillance requirement; however, the Licensee evaluation of the proposed exemption has determined that the proposed exemption meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9).

Based on the above review of the proposed exemption, the Licensee has determined that the proposed activity does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in the individual or cumulative occupational radiation exposure. Accordingly, the proposed exemption meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), an environmental impact statement or environmental assessment of the proposed exemption is not required.

Specific details of the environmental considerations supporting this request for exemption are provided in Section 5 of the associated License Amendment Request provided in Enclosure 1 of this letter.

8.0 CONCLUSION

The proposed changes to Tier 1 are necessary to revise the plant-specific ITAAC requirements regarding the fire pumps minimum total head and diesel-driven fire pump fuel day tank capacity. The exemption request meets the requirements of 10 CFR 52.63, Finality of design certifications, 10 CFR 52.7, Specific exemptions, 10 CFR 50.12, Specific exemptions, and 10 CFR 52 Appendix D, Design Certification Rule for the AP1000. Specifically, the exemption request meets the criteria of 10 CFR 50.12(a)(1) in that the request is authorized by law, presents no undue risk to public health and safety, and is consistent with the common defense and security. Furthermore, approval of this request does not result in a significant decrease in the level of safety, satisfies the underlying purpose of the AP1000 Design Certification Rule, and does not present a significant decrease in safety as a result of a reduction in standardization.

9.0 REFERENCES

1. Exemption and Amendment No. 12 to Combined Licenses Nos. NPF-93 and NPF-94 for Virgil C. Summer Nuclear Station Units 2 and 3 [ML14120A364]
2. NND-14-0424 Letter from April R. Rice to NRC Document Control Desk, “Report of 10 CFR 50.59 Changes, Tests and Experiments and 10 CFR 52 Appendix D Departure Report,” dated July 28, 2014 [ML14209A077]
3. NND-16-0028 Letter from April R. Rice to NRC Document Control Desk, “Report of 10 CFR 50.59 Changes, Tests and Experiments and 10 CFR 52 Appendix D Departure Report,” dated February 1, 2016 [ML16034A199]

South Carolina Electric & Gas Company

Virgil C. Summer Nuclear Station Units 2 & 3

NND-16-0363

Enclosure 3

Proposed Changes to

Licensing Basis Documents

(LAR 16-13)

Note:
Added text is shown as bold **Blue Underline**
Deleted text is shown as bold ~~**Red Strikethrough**~~

Omitted text is shown as three asterisks (* * *)

(Enclosure 3 consists of 4 pages, including this cover page)

COL Appendix C (and Plant-Specific Tier 1) Section 2.3.4

Revise COL Appendix C (and Plant-Specific Tier 1) Section 2.3.4 by revising the FPS fire pumps minimum rated head requirement in Design Description Item 8, as follows:

8. Two FPS fire pumps provide at least 2000 gpm each at a total head of at least ~~300~~ 350 ft.

Revise COL Appendix C (and Plant-Specific Tier 1) Section 2.3.4 by revising the diesel-driven fire pump fuel day tank minimum volume in Design Description Item 9, as follows:

9. The fuel tank for the diesel-driven fire pump is capable of holding at least ~~240~~ 385 gallons.

COL Appendix C (and Plant-Specific Tier 1) Table 2.3.4-2

Revise COL Appendix C (and Plant-Specific Tier 1) Table 2.3.4-2, Inspections, Tests, Analyses, and Acceptance Criteria, by revising the FPS fire pumps minimum rated head requirement and the diesel-driven fire pump fuel day tank minimum volume requirement in Items 8 and 9, respectively, as follows:

Table 2.3.4-2
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
* * *		
8. Two FPS fire pumps provide at least 2000 gpm each at a total head of at least ~~300~~ 350 ft.	Testing and/or analysis of each fire pump will be performed.	The tests and/or analysis concludes that each fire pump provides a flow rate of at least 2000 gpm at a total head of at least ~~300~~ 350 ft.
9. The fuel tank for the diesel-driven fire pump is capable of holding at least ~~240~~ 385 gallons.	Inspection of the diesel-driven fire pump fuel tank will be performed.	The volume of the diesel driven fire pump fuel tank is at least ~~240~~ 385 gallons.
* * *		

UFSAR Tier 2 Table 9.5.1-2
Component Data – Fire Protection System (Nominal Values)

Revise Tier 2 information in UFSAR Table 9.5.1-2, as follows:

* * *	
Fire Pumps	
Motor-Driven	
Pump type	Horizontal centrifugal
Rated flow (gpm)	2000
Required head, approximate (ft)	~~300~~ 350
Structural material	Cast iron
Diesel-Driven	
Pump type	Horizontal centrifugal
Rated flow (gpm)	2000
Required head, approximate (ft)	~~300~~ 350
Structural material	Cast iron
Fuel tank capacity (min. gal)	~~240~~ 385
* * *	

UFSAR Tier 2 Table 14.3-4
Fire Protection

Revise Tier 2 information in UFSAR Table 14.3-4, as follows:

Reference	Design Feature	Value
* * *		
Section 9.5.1.2.1.5	The volume of the water in the PCS tank is sufficient to supply two hose streams, each with a flow of 75 gallons per minute, for two hours (gal).	≥ 18,000
Table 9.5.1-2	Each fire pump is rated: – Flow rate (gpm) – Total head (ft)	 ≥ 2000 ≥ ~~300~~ 350
Section 18.8.3.2	The human system interface resources available at each workstation are the plant information system displays, the control displays (soft controls), the alarm system support displays, procedure system, and the screen and component selector.	
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