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

Subject: LAR 17-13: VCSNS Units 2&3 Request for License Amendment and  
Exemption: Central Chilled Water System (VWS) Optimization Changes

References: 1. ND-17-0704, Southern Nuclear Operating Company Vogtle Electric  
Generating Plant Units 3 and 4 Request for License Amendment and  
Exemption: Central Chilled Water System (VWS) Optimization Changes  
(LAR-17-015) Dated April 27, 2017 (Accession Number ML17118A049)

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 South Carolina Public Service Authority (Santee Cooper), the Licensees for Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3, request an amendment to Combined License (COL) Numbers NPF-93 and NPF-94, for VCSNS Units 2 and 3, respectively. The requested amendment proposes to depart from approved AP1000 Design Control Document (DCD) Tier 2 information (text and tables) as incorporated into the Updated Final Safety Analysis Report (UFSAR) as plant-specific DCD information, and also proposes to depart from involved plant-specific Tier 1 information (and associated COL Appendix C 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 requested amendment proposes changes to COL Appendix C (and plant-specific Tier 1) Table 2.7.2-2 to revise the minimum chilled water flow rates to the supply air handling units serving the Main Control Room (MCR) and the Class 1E electrical rooms, and the unit coolers serving the normal residual heat removal system (RNS) and chemical and volume control system (CVS) pump rooms. The proposed COL Appendix C (and plant-specific DCD Tier 1) changes require additional changes to corresponding Tier 2 component data information in UFSAR Chapters 6 and 9.

Enclosure 1 provides the description, technical evaluation, regulatory evaluation (including the Significant Hazards Consideration Determination), and environmental

considerations for the proposed changes in the License Amendment Request (LAR). Enclosure 2 provides the background and supporting basis for the requested exemption. Enclosure 3 provides the proposed changes to the VCSNS Units 2&3 licensing basis documents.

The changes proposed in this LAR are consistent in technical content with Reference 1 and includes one additional change to UFSAR Subsection 6.4.1.1 to address a site-specific VCSNS Units 2&3 ambient temperature parameter.

SCE&G requests NRC staff approval of the license amendment by October 20, 2017, to support installation of the low capacity air-cooled chiller pump. SCE&G expects to implement this proposed amendment (through incorporation into the licensing basis documents; e.g., the UFSAR) within 30 days of approval of the requested changes. Southern Nuclear Operating Company has indicated the requested approval date for the Vogtle Electric Generating Plant Units 3 and 4 license amendment request for this topic is November 7, 2017.

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 and enclosures to the designated State Official.

This letter contains no regulatory commitments. This letter, including enclosures, has been reviewed and confirmed to not contain security-related information.

Should you have any questions, please contact Mr. Nick Kellenberger by telephone at (803) 941-9834, or by email at [nicholas.kellenberger@scana.com](mailto:nicholas.kellenberger@scana.com).

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

Executed on this 1<sup>st</sup> day of June, 2017.

Sincerely,



April R. Rice  
Manager, Nuclear Licensing  
New Nuclear Deployment

ARR/gt

Enclosure 1: Request for License Amendment, Central Chilled Water System (VWS)  
Optimization Changes (LAR 17-13)

Enclosure 2: Request for Exemption, Central Chilled Water System (VWS) Optimization  
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Enclosure 3: Proposed Changes to the Licensing Basis Documents (LAR 17-13)

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**South Carolina Electric & Gas Company  
Virgil C. Summer Nuclear Station Units 2 and 3**

**NND-17-0275**

**Enclosure 1**

**Request for License Amendment,  
Central Chilled Water System (VWS) Optimization Changes  
(LAR 17-13)**

**(Enclosure 1 consists of seventeen pages, including this cover page.)**

NND-17-0275

Enclosure 1

Request for License Amendment, Central Chilled Water System (VWS) Optimization Changes  
(LAR 17-13)

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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 South Carolina Public Service Authority (Santee Cooper), the Licensees for Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3, request an amendment to Combined License (COL) Numbers NPF-93 and NPF-94, for VCSNS Units 2 and 3, respectively.

## 1. SUMMARY DESCRIPTION

The requested amendment requests changes to UFSAR Table 9.2.7-1 to revise the capacity of the air-cooled chiller and the flow rates for the central chilled water system (VWS) cooling coils. These proposed changes also involve changes to the VWS cooling coil flow rates as identified in plant-specific Tier 1 Table 2.7.2-2, Inspections, Tests, Analyses and Acceptance Criteria (ITAAC) item 3.a) (and COL Appendix C Table 2.7.2-2, ITAAC No. 2.7.02.03a).

The VWS provides chilled water to the nuclear island nonradioactive ventilation system (VBS) supply air handling units (AHUs) serving the main control room (MCR)/Control Support Area (CSA), and the Class 1E electrical rooms. Chilled water is also provided to the radiologically controlled area (RCA) ventilation system (VAS) unit coolers serving the normal residual heat removal system (RNS) pump rooms and the chemical and volume control system (CVS) makeup pump room. As a result of reduced heat loads in the serviced areas, VBS AHU and VAS unit cooler equipment parameter changes are proposed in UFSAR Tables 9.4.1-1, 9.4.12, and 9.4.3-1.

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

## 2. DETAILED DESCRIPTION and TECHNICAL EVALUATION

As described in UFSAR Subsection 9.2.7, the central chilled water system (VWS) supplies chilled water to the heating, ventilation and air conditioning (HVAC) systems as a cooling medium to satisfy the room air temperature requirements for the plant. The VWS consists of two closed loop subsystems: a combination water-cooled chiller and air-cooled chiller high capacity system and an air-cooled chiller low capacity system. The VWS serves no safety-related function other than containment isolation. Specifically, the VWS low capacity subsystem provides chilled water to the cooling coils of the VBS AHUs and the VAS unit coolers.

The VWS low capacity (LC) subsystem provides a reliable source of chilled water to remove the maximum heat loads from the areas serviced by the VBS AHUs and VAS unit coolers. The VWS LC subsystem maintains a chilled water supply temperature of 40°F with a return temperature of 56°F, which is a temperature differential of 16°F across the LC chillers. To maintain the 16°F temperature differential and remove the maximum heat load from the

areas serviced by the VBS and VAS, the VWS must provide the required chilled water flow rates through the cooling coils of the VBS AHUs and VAS unit coolers.

The AP1000 ventilation systems are designed using conservative, bounding values for heat loads. Due to changes in the equipment, layout, and system design, heat loads have been reduced in the areas serviced by the VBS and VAS including the following:

- MCR/ CSA
- Class 1E electrical rooms
- RNS pump rooms
- CVS makeup pump rooms

The reduction in heat loads requires lower cooling coil flow rates to be utilized for the VBS AHUs and VAS unit coolers to maintain the required environment in the serviced areas. The VWS is optimized and the flow rates are effectively reduced to prevent overcooling in the serviced areas and therefore do not result in undesirable room conditions such as condensation. Therefore, changes are required to air-cooled chiller cooling coil flow rates as described in UFSAR Table 9.2.7-1, which involves changes to the cooling coil flow rates to Tier 1 (and COL Appendix C) Table 2.7.2-2, ITAAC No. 2.7.02.03a. Additionally, the capacity for the VWS low capacity air-cooled chiller is reduced from 300 tons to 230 tons in UFSAR Table 9.2.7-1 to meet the reduced heat loads required for the VBS AHUs and VAS unit coolers.

The VBS provides ventilation and cooling in the MCR/CSA and the Class 1E electrical rooms for Divisions A/C and Divisions B/D. The VBS functions to maintain the MCR and equipment rooms within their design temperature ranges. The VBS utilizes AHUs to supply conditioned air to the areas being serviced. The VBS supply duct to the MCR is continuously monitored for radioactive particulate, iodine, and noble gas concentrations.

The VAS provides ventilation and cooling to the RNS pump rooms and the CVS makeup pump room. The VAS provides this function to maintain the equipment rooms within their design temperature ranges. The VAS unit coolers provide localized cooling to the areas being serviced.

To meet the reduced heat loads described above, changes are also proposed to the required airflows, cooling coil capacities and other equipment parameters for the VBS AHUs and VAS unit coolers. Revisions to the parameters for VBS AHUs are proposed as described below in Table 2-3 (UFSAR Table 9.4.1-1), Tables 2-4 and 2-5 (UFSAR Table 9.4.1-2) and for VAS unit coolers in Tables 2-6 and 2-7 (UFSAR Table 9.4.3-1).



Description of Changes and Technical Justification

The following changes to VWS cooling coil flow rates are a result of reduced heat loads in the areas serviced by the VBS AHUs and VAS unit coolers. Tables 2-1 and 2-2 below reflect nominal values. These changes permit the air chiller to meet chilled water demands. Each table is followed by the associated justification for the changes in parameter values.

**TABLE 2-1**

*Proposed changes for the water flow (gpm) to each coil as described in UFSAR Table 9.2.7-1*

<b>Coil</b>	<b>Current Licensing Flow Rate (gpm)</b>	<b>Proposed Licensing Flow Rate* (gpm)</b>
VBS MY C01A/B	138	101
VBS MY C02A/C	108	106
VBS MY C02B/D	84	56
VAS MY C07A/B	24	14
VAS MY C12A/B	15	10
VAS MY C06A/B	15	10

\*Note: Heat loads used to determine cooling coil flow rates include 15% margin.

The identified VBS and VAS cooling coils are associated with the following equipment and serviced areas:

- VBS MY C01A/B -- VBS AHU (VBS MS 02A/B - MCR/CSA)
- VBS MY C02A/C -- VBS AHU (VBS MS 03A/C - Class 1E Division A/C Electrical Room)
- VBS MY C02B/D -- VBS AHU (VBS MS 03B/D - Class 1E Division B/D Electrical Room)
- VAS MY C07A/B -- VAS unit cooler (VAS MS 05A/B - CVS Makeup Pump Room)
- VAS MY C12A/B -- VAS unit cooler (VAS MS 06A/B - RNS Pump Room)
- VAS MY C06A/B -- VAS unit cooler (VAS MS 06A/B - RNS Pump Room)

The descriptions identified for each coil are added to UFSAR Table 9.2.7-1. This change to identify the associated room which is serviced by the VBS AHU coils and VAS unit cooler coils is a clarification and provides a connection point to the equipment tables in UFSAR Chapter 9 related to VBS and VAS components. There is no adverse impact to VBS and VAS functions as a result of this change.

The reduced heat loads in the affected areas result in reduced required VWS cooling coil capacities (or heat load) for the LC subsystem air chiller. This reduced capacity is then used to determine the cooling coil flow rates. As a result, the VWS cooling coil flow rates are

reduced for chilled water flow to each VBS AHU and VAS unit cooler as identified above in Table 2-1 (excerpt from UFSAR Table 9.2.7-1).

The function of the cooling coils is not changed by this activity and the capability of the VBS AHUs and VAS unit coolers to perform their cooling function is not adversely impacted. The change in flow rates does not adversely impact the function of the VBS AHUs or VAS unit coolers to provide required cooling for the areas they service including the MCR, Class 1E electrical rooms and the RNS and CVS pump rooms. Proposed changes to the VBS and VAS cooling coil capacities are described below in Tables 2-3, 2-4, 2-5, 2-6, and 2-7.

Additionally, the capacity for the LC air-cooled chiller is reduced from 300 tons to 230 tons to meet the reduced heat loads for the VBS AHUs and VAS unit coolers. This is reflected in the proposed changes to UFSAR Table 9.2.7-1. The chiller was originally sized for higher heat loads in the areas serviced by the AHUs and unit coolers and the associated VWS cooling coils. This change is also consistent with the existing Tier 1 ITAAC No. 2.7.02.03a which identifies the heat transfer rate of the air-cooler chiller is greater than or equal to 230 tons. The resized chiller provides sufficient capacity over and above required margins for the system. The VWS pump is sized commensurate with the chiller. The function of the chiller is not adversely impacted as chilled water flow rates are sufficient to provide cooling to the areas serviced by the VBS and VAS HVAC components. The chiller is considered a risk-significant SSC as part of the design reliability assurance program (D-RAP). The changes to the chiller capacity do not adversely impact the insights and assumptions identified in UFSAR Table 17.4-1 as the VWS continues to provide cooling water to the CVS makeup pump room. The AP1000 HVAC system design parameters include a 15% margin as per the Utility Requirements Document (URD) recommendations discussed below.

The VWS cooling coil flow rates are also identified in Tier 1 Table 2.7.2-2, ITAAC No. 2.7.02.03a, as discussed below.

**TABLE 2-2**

*Proposed changes for the water flow (gpm) to each coil as described in COL Appendix C (and plant-specific Tier 1) Table 2.7.2-2, ITAAC No. 2.7.02.03a:*

<b>Coil</b>	<b>Current Licensing Flow Rate (gpm)</b>	<b>Proposed Licensing Flow Rate* (gpm)</b>
VBS MY C01A/B	138	96
VBS MY C02A/C	108	97
VBS MY C02B/D	84	52
VAS MY C07A/B	24	12.3
VAS MY C12A/B	15	8.2
VAS MY C06A/B	15	8.2

\* Note: The 15% margin is not included in the heat loads used to calculate the flow rate identified in the ITAAC acceptance criteria.

The intent of ITAAC No. 2.7.02.03a is to verify that the as-built VWS is capable of meeting the design requirements set forth in UFSAR Subsection 9.2.7-1. However, future heat load growth is taken into account when developing the VWS testing conditions and identifying the test equipment and the values used for testing. The preoperational and startup testing for the VWS will include the ITAAC testing per Tier 1 Table 2.7.2-2, ITAAC No. 2.7.02.03a, which states that the measured flow rates must meet or exceed those specified in the Acceptance Criteria. The proposed values for the cooling coil flow rates are slightly less than the flow rates identified above in Table 2-1 (UFSAR Table 9.2.7-1). The basis for the ITAAC flow rates uses the design heat loads without the additional 15% margin that was added to the equipment calculated design basis heat loads to account for future heat load growth.

The AP1000 design basis employs recommendations from the Utility Requirements Document (URD) on equipment margin. These recommendations are based on operating plant experience over the life of the current operating nuclear fleet. In the case of HVAC systems, the recommendation is that 15% margin be applied to the system ductwork pressure drop and that 15% margin be applied to the system calculated heat load. This recommendation is due to operating experience, which indicated that air flows and equipment loads were sometimes underestimated during the design phase of the project.

The flow rates used for ITAAC testing are selected to confirm that VWS chillers can provide, and the AHUs and unit coolers can pass, the flow rates required to meet the calculated design basis heat loads. However, the design basis heat loads used for component sizing are purposefully selected with the intent of being higher than the calculated design heat load so that the systems are not challenged during operation. Therefore, a more realistic test point for ITAAC testing would be one based upon the calculated heat load (without the additional 15% margin) since it would represent the as-installed condition of the system.

Therefore, the proposed changes described above in Table 2-2 to Tier 1 Table 2.7.2-2 do not adversely impact the VWS cooling coil flow rates as the LC air chiller maintains the ability to provide chilled water to the VBS AHUs and VAS unit coolers at the required flow rates.

### **Other Proposed Tier 2 Changes**

UFSAR Subsection 6.4.1.1 is revised to change the low capacity air-cooled chiller capacity from 322 tons to 230 tons as a result of the reduced heat loads required for the VBS AHUs and VAS unit coolers. Associated Reference 201 has been reviewed. The conditions for acceptable chiller performance described in this reference are still bounding. The MCR design basis described in this section is not changed and does not adversely impact habitability of the MCR. This change does not adversely impact the VBS design function to maintain design conditions in the areas being serviced including the MCR/CSA and Class 1E electrical rooms. This change also does not adversely impact the VAS design function to maintain design conditions in the areas being serviced including the RNS pump rooms and CVS makeup pump room.

Heat load reductions in the MCR/CSA, Class 1E electrical rooms, RNS pump rooms, and CVS makeup pump room result in equipment parameter changes as proposed in the tables below for VBS and VAS equipment due to changes in equipment located in these areas. These changes permit the air-cooled chiller to meet chilled water demands. Each table is followed by the associated justification for the changes in parameter values. The tables below reflect nominal values.

**NOTE:** The 15% heat load margin recommended by the URD is reflected in the fan static pressures and the cooling coil capacities identified in the following tables. Design airflows are determined based upon area heating and cooling loads with a 15% margin included.

**TABLE 2-3**

*UFSAR Table 9.4.1-1, Sheet 1, VBS MCR/CSA HVAC Subsystem, MCR/CSA Supply AHUs (VBS MS 02A/B)*

<b>Parameter</b>	<b>Proposed Licensing Value</b>
Supply Fan Design Airflow (scfm)	17,360
Supply Fan Static Pressure (in. wg)	7.5
Return Air/Smoke Purge Fan Design Airflow (scfm)	15,860
Return Air/Smoke Purge Fan Static Pressure (in. wg)	4.4
Cooling Coil Capacity (Btu/hr)	807,140

The reduced heat loads in these areas result in a decreased flow rate requirement for the VWS cooling coils as identified above in the proposed changes in Table 2-1. Reduced heat loads in the MCR/CSA also result in reduced supply and return fan design airflow requirements. The cooling coil capacity is reduced in like manner as less chilled water is needed to meet the operational needs of the AHUs to maintain the MCR and CSA within their design temperature ranges. The proposed changes to the MCR supply AHUs do not adversely impact the function of the AHUs to maintain the MCR/CSA environment at the required temperatures, as equipment is adequately sized to handle the heat loads in the area. Changes to the VBS supply air flows do not adversely impact radiation monitoring capabilities as the function of monitoring the VBS supply air for radioactive particulate, iodine and noble gas concentrations is not changed.

**TABLE 2-4**

*UFSAR Table 9.4.1-2, Sheet 1, Class 1E Electrical Room HVAC Subsystem, Division A & C Supply AHUs (VBS MS 03A/C)*

<b>Parameter</b>	<b>Proposed Licensing Value</b>
Supply Fan Design Airflow (scfm)	17,900
Supply Fan Static Pressure (in. wg)	7.0
Return Air/Smoke Purge Fan Design Airflow (scfm)	16,280
Return Air/Smoke Purge Fan Static Pressure (in. wg)	4.1
Cooling Coil Capacity (Btu/hr)	851,680

The reduced heat loads in this area result in a decreased flow rate requirement for the VWS cooling coils as identified above in the proposed changes in Table 2-1. Reduced heat loads in the Division A and C Class 1E electrical rooms result in reduced supply fan design airflow requirements. The return fan design airflow is increased. The cooling coil capacity is reduced in like manner as less chilled water is needed to meet the operational needs of the AHUs to maintain the electrical rooms within their design temperature ranges. The proposed changes to the Class 1E electrical room supply AHUs do not adversely impact the function of the AHUs to maintain the Class 1E electrical room environments at the required temperatures, as equipment is adequately sized to handle the heat loads in the area.

**TABLE 2-5**

*UFSAR Table 9.4.1-2, Sheet 2, Class 1E Electrical Room HVAC Subsystem, Division B & D Supply AHUs (VBS MS 03B/D)*

<b>Parameter</b>	<b>Proposed Licensing Value</b>
Supply Fan Design Airflow (scfm)	10,480
Return Air/Smoke Purge Fan Design Airflow (scfm)	9,790
Return Air/Smoke Purge Fan Static Pressure (in. wg)	3.0
Cooling Coil Capacity (Btu/hr)	450,320

The reduced heat loads in this area result in a decreased flow rate requirement for the VWS cooling coils as identified above in the proposed changes in Table 2-1. Reduced heat loads in the Division B and D Class 1E electrical rooms result in reduced supply and return fan design airflow requirements. The cooling coil capacity is reduced in like manner as less

chilled water is needed to meet the operational needs of the AHUs to maintain the electrical rooms within their design temperature ranges. The proposed changes to the Class 1E electrical room supply AHUs do not adversely impact the function of the AHUs to maintain the Class 1E electrical room environments at the required temperatures, as the equipment is adequately sized to handle the heat loads in the area.

**TABLE 2-6**

*UFSAR Table 9.4.3-1, Auxiliary/Annex Building Ventilation Subsystem, Normal Residual Heat Removal (RNS) Pump Room Unit Coolers (VAS MS 06A/B)*

Parameter	Proposed Licensing Value
Cooling Coil Capacity (Btu/hr)	75,250

The reduced heat loads on the unit coolers result in decreased flow rate requirements for the VWS cooling coils as described above in Table 2-1. The heat loads in the RNS pump rooms have decreased and therefore, the cooling coil capacity (Btu/hr) needed to cool the room is reduced. The design airflow is not changed. The proposed changes to the RNS pump room unit coolers do not adversely impact the function of the unit coolers to maintain the RNS pump room environments at the required temperatures, as equipment is adequately sized to handle the heat loads in the area.

**TABLE 2-7**

*Table 9.4.3-1, Auxiliary/Annex Building Ventilation Subsystem, Chemical and Volume Control Makeup Pump Room Unit Coolers (VAS MS 05A/B)*

Parameter	Proposed Licensing Value
Cooling Coil Capacity (Btu/hr)	113,320

The reduced loads on the unit coolers result in a decreased flow rate requirement for the VWS cooling coils as described above in Table 2-1. The airflow required by the CVS makeup pump room unit coolers has decreased and therefore, the cooling coil capacity (Btu/hr) needed to cool the room is reduced. The design airflow is not changed. The proposed changes to the CVS makeup pump room unit coolers do not adversely impact the function of the unit coolers to maintain the CVS makeup pump room environments at the required temperatures, as equipment is adequately sized to handle the heat loads in the area.

Proposed changes to revise VBS AHU and VAS unit cooler parameters and VWS cooling coil flow rates do not involve an interface with any SSC accident initiator or initiating sequence of events related to the accidents evaluated in the plant-specific DCD or UFSAR. The changes to COL Appendix C (and plant-specific Tier 1) and UFSAR design information do not adversely impact safety-related equipment or a fission product barrier. No system or equipment qualification is adversely affected by the proposed changes. The changes do not result in a new failure mode, malfunction or sequence of events that could adversely affect a radioactive material barrier or safety-related equipment. The proposed changes do not allow

for a new fission product release path, result in a new fission product barrier failure mode, or create new sequence of events that would result in significant fuel cladding failures. The changes do not adversely impact any functions associated with containing, controlling, channeling, monitoring, or processing radioactive or non-radioactive materials. The types and quantities of expected plant effluents are not changed. No effluent release path is associated with these components. Therefore, neither radioactive nor non-radioactive material effluents are affected by this activity.

The changes to Tier 1 Table 2.7.2-2, UFSAR Table 9.2.7-1, and associated design information do not adversely impact radiologically controlled zones. Plant radiation zones, radiation controls established to satisfy 10 CFR 20 requirements, and expected amounts and types of radioactive materials are not affected by the proposed changes. Therefore, individual and cumulative radiation exposures are not significantly affected by this change.

#### Summary of Licensing Basis Change Descriptions

The following changes to COL Appendix C (and corresponding Tier 1) information are proposed:

#### COL Appendix C (and plant-specific Tier 1) Table 2.7.2-2, ITAAC No. 2.7.02.03a

Revise flow rates for the following cooling coils:

- VBS MY C01A/B – 96 gpm
- VBS MY C02A/C – 97 gpm
- VBS MY C02B/D – 52 gpm
- VAS MY C07A/B – 12.3 gpm
- VAS MY C12A/B – 8.2 gpm
- VAS MY C06A/B – 8.2 gpm

The following involved changes to UFSAR design information are proposed:

#### Subsection 6.4.1.1

Revise capacity of the low capacity air-cooled chillers from 322 tons to 230 tons.

#### Table 9.2.7-1

1. Revise capacity of the low capacity air-cooled chillers from 300 nominal tons to 230 nominal tons.
2. Revise flow rates for the following cooling coils:
  - VBS MY C01A/B – 101 gpm
  - VBS MY C02A/C – 106 gpm
  - VBS MY C02B/D – 56 gpm
  - VAS MY C07A/B – 14 gpm
  - VAS MY C12A/B – 10 gpm
  - VAS MY C06A/B – 10 gpm

3. Add description of the rooms associated with each cooling coil.

Table 9.4.1-1, Sheet 1

Revise parameters for the MCR/CSA HVAC Subsystem Supply AHUs (VBS MS 02A/B).

Table 9.4.1-2, Sheet 1

Revise parameters for the Division A/C Class 1E Electrical Room Supply AHUs (VBS MS 03A/C).

Table 9.4.1-2, Sheet 2

Revise parameters for Division B/D Supply AHUs (VBS MS 03B/D).

Table 9.4.3-1

1. Revise parameters for RNS pump room unit coolers (VAS MS 06A/B).
2. Revise parameters for CVS makeup pump room unit coolers (VAS MS 05A/B).

Summary

The proposed changes to reduce the cooling coil flow rates identified in COL Appendix C (and plant-specific Tier 1) and associated UFSAR design information will not adversely affect safety-related equipment or function, design function, radioactive material barrier or safety analysis. Associated changes to the UFSAR VBS and VAS information also will not adversely affect safety-related equipment or function, design function, radioactive material barrier or safety analysis.

### **3. TECHNICAL EVALUATION (Included in Section 2)**

## **4. REGULATORY EVALUATION**

### **4.1 Applicable Regulatory Requirements/Criteria**

10 CFR 52.98(c) 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 departure from COL Appendix C information and corresponding plant-specific Tier 1 information; therefore, this activity requires an 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 Technical Specifications, or requires a license amendment under paragraphs B.5.b or B.5.c of the section. The proposed change to UFSAR (Tier 2) design information involves changes to plant-specific Tier 1 (and



corresponding changes to COL Appendix C) Table 2.7.2-2, and thus requires NRC approval for the Tier 2 and involved Tier 1 departures.

10 CFR 50, Appendix A, "General Design Criteria for Nuclear Power Plants" General Design Criteria (GDC) 19 – *Control Room*. A control room shall be provided from which actions can be taken to operate the nuclear power unit safely under normal conditions and to maintain it in a safe condition under accident conditions, including loss-of-coolant accidents. The proposed changes do not adversely impact the nuclear island nonradioactive ventilation system (VBS) supply air handling units (AHUs) that maintain required temperatures in the main control room (MCR) during normal operation. Radiation monitoring capabilities required for the MCR/CSA are not adversely impacted as the function of monitoring the VBS supply air for radioactive particulate, iodine and noble gas concentrations is not changed. Therefore, compliance with GDC 19 is not changed.

#### **4.2 Precedent**

No precedent is identified.

#### **4.3 Significant Hazards Consideration Determination**

This review supports a request to amend the licensing basis documents to allow departure from Updated Final Safety Analysis Report (UFSAR) and Combined Licenses (COLs) regarding COL Appendix C information (and associated plant-specific Tier 1) information, and Tier 2 information involving Tier 1 information. Proposed changes revise UFSAR Table 9.2.7-1 to identify reduced cooling coil flow rates for the chilled water system (VWS). This system provides chilled water to the nuclear island nonradioactive ventilation system (VBS) supply air handling units (AHUs) serving the main control room (MCR)/Control Support Area (CSA), the Class 1E electrical rooms, and the radiologically controlled area (RCA) ventilation system (VAS) unit coolers serving the normal residual heat removal system (RNS) pump rooms and the chemical and volume control system (CVS) makeup pump room. In addition, UFSAR Table 9.2.7-1 and Subsection 6.4.1.1 are changed to revise the low-capacity air-cooled chiller capacity. These Tier 1 changes also involve changes to revise plant-specific Tier 1 (and COL Appendix C) Table 2.7.2-2 and Inspections, Tests, Analyses and Acceptance Criteria (ITAAC) No. 2.7.02.03a to identify reduced cooling coil flow rates for the VWS. Reduced heat loads in the areas serviced by the VBS AHUs and the VAS unit coolers result in revised equipment parameters. These changes are proposed to revise UFSAR Tables 9.4.1-1, 9.4.1-2, and 9.4.3-1.

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 proposed changes to COL Appendix C (and plant-specific Tier 1) Table 2.7.2-2, Updated Final Safety Analysis Report (UFSAR) Table 9.2.7-1, and associated UFSAR design information to identify the revised equipment parameters for the nuclear island nonradioactive ventilation system (VBS) air handling units (AHUs) and radiologically controlled area (RCA) ventilation system (VAS) unit coolers and reduced chilled water system (VWS) cooling coil flow rates does not adversely impact the plant response to any accidents which are previously evaluated. The function of the cooling coils to provide chilled water to the VBS AHUs and VAS unit coolers is not credited in the safety analysis.

No safety-related structure, system, component (SSC) or function is adversely affected by this change. The change does not involve an interface with any SSC accident initiator or initiating sequence of events, and thus, the probabilities of the accidents evaluated in the plant-specific UFSAR are not affected. The proposed changes do not involve a change to the predicted radiological releases due to postulated accident conditions, thus, the consequences of the accidents evaluated in the UFSAR are not affected. The proposed changes do not increase the probability or consequences of an accident previously evaluated as the VWS, VBS and VAS do not provide safety-related functions and the functions of each system to support required room environments are not changed.

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 to COL Appendix C (and plant-specific Tier 1) Table 2.7.2-2, UFSAR Table 9.2.7-1, and associated UFSAR design information to identify the revised equipment parameters for VBS AHUs and VAS unit coolers and reduced VWS cooling coil flow rates do not affect any safety-related equipment, and do not add any new interfaces to safety-related SSCs. The VWS function to provide chilled water is not adversely impacted. The function of the VAS to provide ventilation and cooling to maintain the environment of the serviced areas within the design temperature range is not adversely impacted by this change. No system or design function or equipment qualification is affected by these changes as the change does not modify the operation of any SSCs. The changes do not introduce a new failure mode, malfunction or sequence of events that could affect safety or safety-related equipment. Revised equipment parameters, including the reduced cooling coil flow rates, do not adversely impact the function of associated components.

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 changes to COL Appendix C (and plant-specific Tier 1) Table 2.7.2-2, UFSAR Table 9.2.7-1, and associated UFSAR design information do not affect any other safety-related equipment or fission product barriers. The requested changes will not adversely affect compliance with any design code, function, design analysis, safety analysis input or result, or design/safety margin. No safety analysis or design basis acceptance limit/criterion is challenged or exceeded by the requested changes as previously evaluated accidents are not impacted.

Therefore, the proposed amendment does not involve a significant reduction in the 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 requested 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 change does not involve a significant hazards consideration.

**5. ENVIRONMENTAL CONSIDERATIONS**

This review supports a request to amend the licensing basis documents to allow departure from the Updated Final Safety Analysis Report (UFSAR) and Combined Licenses (COLs) regarding COL Appendix C information (and associated plant-specific Tier 1 information), and Tier 2 information involving Tier 1 information related to the proposed changes.

The proposed changes as described in associated UFSAR information identifies changes to the central chilled water system (VWS) cooling coil flow rates in UFSAR Table 9.2.7-1. Reduced heat loads to the areas serviced by the nonradioactive ventilation system (VBS) air handling units (AHUs) and radiologically controlled area (RCA) ventilation system (VAS) unit

coolers result in revised equipment parameters. Proposed changes are required in UFSAR Tables 9.4.1-1, 9.4.1-2 and 9.4.3-1. Additionally, UFSAR Table 9.2.7-1 and Subsection 6.4.1.1 are revised to identify the reduced low-capacity air-cooled chiller capacity. The proposed Tier 2 changes also involve changes to plant-specific Tier 1 (COL Appendix C) Table 2.7.2-2 to revise flow rates for the VWS cooling coils to meet the reduced heat loads for the VBS AHUs and VAS unit coolers.

This review has determined that the proposed change would require an amendment from the COL; however, a review of the anticipated construction and operational effects of the proposed amendment has determined that 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 determined 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 proposed activity revises flow rates for the VWS low capacity air-cooled chiller cooling coils to meet the reduced heat loads for areas serviced by the VBS AHUs and VAS unit coolers. The capacity of the chiller is also reduced. Equipment parameters for the VBS AHUs and VAS unit coolers are also revised. The changes are unrelated to any aspects of plant construction or operation that would introduce any changes 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. Furthermore, these changes do not 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 do not impact radiation exposure or dose rates. Plant radiation zones, radiation control established to satisfy 10 CFR 20 requirements, and expected amounts and types of radioactive materials are not affected by the proposed changes. 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 anticipated construction and operational effects of the proposed amendment do 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 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 proposed exemption is not required.

## **6. REFERENCES**

None.

**South Carolina Electric & Gas Company**  
**Virgil C. Summer Nuclear Station Units 2 and 3**

**NND-17-0275**

**Enclosure 2**

**Request for Exemption,  
Central Chilled Water System (VWS) Optimization Changes  
(LAR 17-13)**

**(Enclosure 2 consists of seven pages, including this cover page.)**

## 1.0 PURPOSE

South Carolina Electric & Gas Company (SCE&G), acting on behalf of itself and South Carolina Public Service Authority (Santee Cooper), the Licensees for Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3, request 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 Licensees propose changes to the minimum chilled water flow rates to the chilled water cooling coils for the supply air handling units serving the Main Control Room (MCR)/control support area (CSA) and the Class 1E electrical rooms, and the unit coolers serving the normal residual heat removal system (RNS) and chemical and volume control system (CVS) pump rooms in the Acceptance Criteria for ITAAC Item 3.a).

This request for exemption will apply the requirements of 10 CFR 52, Appendix D, Section VIII.A.4 to allow departures from Tier 1 information due to proposed changes to plant-specific DCD Tier 1 Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC). The Tier 1 information for which a plant-specific departure and exemption is being requested is Tier 1 Table 2.7.2-2, ITAAC Item 3.a), as follows:

- Tier 1 Table 2.7.2-2:
  - Revise the acceptance criteria for ITAAC item 3.a) to change the minimum water flow to cooling coils: VBS MY C01A/B, VBS MY C02A/C, VBS MY C02B/D, VAS MY C07A/B, VAS MY C12A/B, and VAS MY C06A/B. The reduced flow rates for the cooling coils are a result of system optimization that reduced loads on the VBS AHUs and VAS unit coolers to adequately cool room air temperatures while avoiding overcooling room conditions that could result in condensation.

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 a departure from generic Tier 1 information to include the aforementioned heat transfer rate.

## 2.0 BACKGROUND

The Licensees are the holders 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.

The central chilled water system (VWS) supplies chilled water to the heating, ventilation and air conditioning (HVAC) systems as a cooling medium to satisfy the room air temperature requirements for the plant. The VWS consists of two closed loop

subsystems: a combination water-cooled chiller and air-cooled chiller high capacity system and an air-cooled chiller low capacity system. Specifically, the VWS low capacity subsystem provides chilled water to the cooling coils of the Nuclear Island Non-Radioactive Ventilation System (VBS) air handling units (AHUs) and Radiologically Control Area Ventilation System (VAS) unit coolers. The VWS serves no safety-related function other than containment isolation.

Due to changes to equipment, layout, and system design, heat loads are reduced in the areas serviced by the VBS and VAS including the following areas:

- Main control room (MCR)/control support area (CSA)
- Class 1E electrical rooms
- RNS pump rooms
- CVS makeup pump rooms

The reduction in heat loads allows lower cooling coil flow rates to be used for the VBS AHUs and VAS unit coolers to maintain the required environment in the serviced areas. Additionally, the VWS is optimized so that overcooling does not occur in the serviced areas, which could result in undesirable room conditions such as condensation. Therefore, the associated license amendment request (LAR) provided in Enclosure 1 proposes changes to the cooling coil flow rates identified in UFSAR Tier 2 Table 9.2.7-1. This enclosure requests an exemption to allow a departure from the corresponding cooling coil flow rates in generic AP1000 DCD Tier 1 Table 2.7.2-2, ITAAC item number 3.a).

### **3.0 TECHNICAL JUSTIFICATION OF ACCEPTABILITY**

The proposed changes to the ITAAC acceptance criteria for the chilled water flow rates to the cooling coils for the VBS AHUs and VAS unit coolers will continue to demonstrate the ability to provide a reliable supply of chilled water to accommodate the reduced heat loads for the MCR/CSA, Class 1E electrical rooms, and RNS and CVS pump rooms. The proposed change does not introduce any adverse impact to the design function of the VWS, the systems to which the VWS supplies chilled water, including the VAS and VBS, or the cooling coils or any other components therein. The reduced flow rates do not adversely impact the ability of the VBS AHUs or VAS unit coolers, or the cooling coils contained therein, from performing their cooling function. The revised ITAAC Acceptance Criteria will continue to provide assurance that the CWS can provide chilled water at the flow rates necessary to remove the design basis heat loads in these areas.

Detailed technical justification supporting this request for exemption is provided in Section 2 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. Because the Licensees have 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 plant-specific DCD Tier 1 Table 2.7.2-2 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 in Tier 1 Table 2.7.2-2 and elsewhere in Tier 1 of the DCD. Therefore, the affected plant-specific DCD Tier 1 Table 2.7.2-2 will continue to serve its required purpose.

The proposed changes to the ITAAC acceptance criteria for the cooling coil flow rates for the VBS AHUs and VAS unit coolers continue to demonstrate the ability to provide a reliable supply of chilled water to accommodate the reduced heat loads for the MCR/CSA, Class 1E electrical rooms, and RNS and CVS pump rooms. This proposed change does not represent any adverse impact to the design function of the VWS, the systems served by the VWS, such as the VAS and VBS, or the cooling coils or any other systems, structures and components therein, and will continue to protect the health and safety of the public in the same manner. The reduced flow rates 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 Licensees 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 are 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 requested exemption would allow changes to the minimum chilled water flow rates to the chilled water cooling coils identified in the Acceptance Criteria for ITAAC Item 3.a) for the supply AHUs serving the MCR/CSA and the Class 1E electrical rooms, and the unit coolers serving the RNS and CVS pump rooms. The proposed changes, as discussed in Section 2.0, will continue to demonstrate the ability to remove the maximum heat loads in the affected areas by providing a reliable source of chilled water from the VWS to the cooling coils in the VAS and VBS. The proposed changes do not adversely 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 Licensees 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 providing chilled water to the cooling coils of the ventilation equipment serving the MCR, the Class 1E electrical rooms, and the RNS and CVS pump rooms, it is likely that other AP1000 licensees will request this exemption. However, if this is not the case, the special circumstances continue to outweigh any decrease in safety that may result from the reduction in standardization because the design functions of the systems associated with this request continue to be maintained. The proposed change to the chilled water flow rates to cooling coils in the VAS and VBS are departures from information in the generic AP1000 DCD. This exemption request and the associated mark-ups demonstrate that there is a limited change from the standard information provided in the generic AP1000 DCD, thereby minimizing the reduction in standardization and consequently the safety impact from this reduction.

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 proposed exemption would allow changes to the minimum chilled water flow rates to the chilled water cooling coils identified in the Acceptance Criteria for ITAAC item number 3.a) for the supply AHUs serving the MCR/CSA and the Class 1E electrical rooms, and the unit coolers serving the RNS and CVS pump rooms.

Because the design changes associated with this exemption request retain the ability of the VWS and the supported equipment to perform their design functions, there are no new failure modes introduced by these changes. It is concluded that the design changes associated with this proposed exemption will not result in a significant decrease 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 identified.

## 7.0 ENVIRONMENTAL CONSIDERATION

The Licensees request a departure from elements of the certified information in Tier 1 of the generic AP1000 DCD. The Licensees have 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 Licensees 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 Licensees have determined that the proposed activity does not involve (i) a significant hazards consideration determination, (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 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 plant-specific Tier 1 are necessary to verify the VWS provides the VAS and VBS cooling coils with the required flow of chilled water to remove the expected heat load for the serviced areas. 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

None.

**South Carolina Electric & Gas Company**  
**Virgil C. Summer Nuclear Station Units 2 and 3**

**NND-17-0275**

**Enclosure 3**

**Proposed Changes to the Licensing Basis Documents**  
**(LAR 17-13)**

**Note:**

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

\* \* \* Indicates omitted existing text

**(Enclosure 3 consists of seven pages, including this cover page.)**

**COL Appendix C (and plant-specific Tier 1) Table 2.7.2-2**

Revise COL Appendix C (and plant-specific Tier 1) Table 2.7.2-2, by revising the acceptance criterion for Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) No. 2.7.02.03a (i.e., Tier 1 item 3.a), as follows:

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria														
* * *	* * *	* * *														
3.a) The VWS provides chilled water to the supply air handling units serving the MCR, the Class 1E electrical rooms, and the unit coolers serving the RNS and CVS pump rooms.	Testing will be performed by measuring the flow rates to the chilled water cooling coils.	The water flow to each cooling coil equals or exceeds the following: <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: left; padding-right: 20px;"><u>Coil</u></th> <th style="text-align: left;"><u>Flow (gpm)</u></th> </tr> </thead> <tbody> <tr> <td>VBS MY C01A/B</td> <td><del>138</del> <u>96</u></td> </tr> <tr> <td>VBS MY C02A/C</td> <td><del>408</del> <u>97</u></td> </tr> <tr> <td>VBS MY C02B/D</td> <td><del>84</del> <u>52</u></td> </tr> <tr> <td>VAS MY C07A/B</td> <td><del>24</del> <u>12.3</u></td> </tr> <tr> <td>VAS MY C12A/B</td> <td><del>45</del> <u>8.2</u></td> </tr> <tr> <td>VAS MY C06A/B</td> <td><del>45</del> <u>8.2</u></td> </tr> </tbody> </table>	<u>Coil</u>	<u>Flow (gpm)</u>	VBS MY C01A/B	<del>138</del> <u>96</u>	VBS MY C02A/C	<del>408</del> <u>97</u>	VBS MY C02B/D	<del>84</del> <u>52</u>	VAS MY C07A/B	<del>24</del> <u>12.3</u>	VAS MY C12A/B	<del>45</del> <u>8.2</u>	VAS MY C06A/B	<del>45</del> <u>8.2</u>
<u>Coil</u>	<u>Flow (gpm)</u>															
VBS MY C01A/B	<del>138</del> <u>96</u>															
VBS MY C02A/C	<del>408</del> <u>97</u>															
VBS MY C02B/D	<del>84</del> <u>52</u>															
VAS MY C07A/B	<del>24</del> <u>12.3</u>															
VAS MY C12A/B	<del>45</del> <u>8.2</u>															
VAS MY C06A/B	<del>45</del> <u>8.2</u>															
* * *	* * *	* * *														

**UFSAR Subsection 6.4.1.1, Main Control Room Design Basis**

Revise UFSAR Subsection 6.4.1.1 as follows:

\* \* \*

The VBS system maintains design conditions in the MCR during all normal and accident conditions when the VBS system is operational. The LCCWS also serves the RNS and CVS pump room coolers. The nominal refrigeration capacity of each of the air-cooled chillers used in the LCCWS is ~~322~~230 tons at an ambient dry bulb temperature of 115°F (Reference 201).

\* \* \*

**UFSAR Table 9.2.7-1, “Component Data – Central Chilled Water System (Nominal Values)”**

Revise UFSAR Table 9.2.7-1, as follows:

* * *	
<b>Low Capacity Subsystem</b>	
<b>Air-Cooled Chillers</b>	
Capacity (nominal tons)	<del>300</del> <u>230</u>
* * *	
<b>Coil</b>	<b>Flow (gpm)</b>
VBS MY C01 A/B ( <a href="#">MCR/CSA</a> )	<del>138</del> <u>101</u>
VBS MY C02 A/C ( <a href="#">Class 1E Division A/C Electrical Room</a> )	<del>108</del> <u>106</u>
VBS MY C02 B/D ( <a href="#">Class 1E Division B/D Electrical Room</a> )	<del>84</del> <u>56</u>
VAS MY C07 A/B ( <a href="#">CVS Makeup Pump Room</a> )	<del>24</del> <u>14</u>
VAS MY C12 A/B ( <a href="#">RNS Pump Room</a> )	<del>15</del> <u>10</u>
VAS MY C06 A/B ( <a href="#">RNS Pump Room</a> )	<del>15</del> <u>10</u>
* * *	

**UFSAR Table 9.4.1-1 (Sheet 1 of 2), “Component Data – Nuclear Island  
Nonradioactive Ventilation System MCR/CSA HVAC Subsystem  
(Nominal Values)”**

Revise UFSAR Table 9.4.1-1 (Sheet 1 of 2), as follows:

<b>Supply Air Handling Units</b>	
Quantity	2
System capacity per unit (%)	100
<b>Supply Fan Requirements</b>	
Type	Centrifugal
Design airflow (scfm)	<del>22,000</del> <u>17,360</u>
Fan static pressure (in. wg)	<del>9.75</del> <u>7.5</u>
<b>Return Air/Smoke Purge Fan Requirements</b>	
Type	Centrifugal
Design airflow (scfm)	<del>20,500</del> <u>15,860</u>
Fan static pressure (in. wg)	<del>6</del> <u>4.4</u>
<b>Cooling Coil Requirements</b>	
Type	Chilled Water
Capacity (Btu/hr)	<del>960,000</del> <u>807,140</u>
Water flow (gpm)	See Table 9.2.7-1
* * *	



**UFSAR Table 9.4.1-2 (Sheet 1 of 3), “Component Data – Nuclear Island  
Nonradioactive Ventilation System Class 1E Electrical Room HVAC Subsystem  
(Nominal Values)”**

Revise UFSAR Table 9.4.1-2 (Sheet 1 of 3), as follows:

<b>Division “A &amp; C” Supply Air Handling Units</b>	
Quantity	2
System capacity per unit (%)	100
<b>Supply Fan Requirements</b>	
Type	Centrifugal
Design airflow (scfm)	<del>18,500</del> <u>17,900</u>
Fan static pressure (in. wg)	<del>6.5</del> <u>7.0</u>
<b>Return Air/Smoke Purge Fan Requirements</b>	
Type	Centrifugal
Design airflow (scfm)	<del>16,000</del> <u>16,280</u>
Fan static pressure (in. wg)	<del>6.0</del> <u>4.1</u>
<b>Cooling Coil Requirements</b>	
Type	Chilled Water
Capacity (Btu/hr)	<del>960,000</del> <u>851,680</u>
Water flow (gpm)	See Table 9.2.7-1
* * *	

**UFSAR Table 9.4.1-2 (Sheet 2 of 3), “Component Data – Nuclear Island  
Nonradioactive Ventilation System Class 1E Electrical Room HVAC Subsystem  
(Nominal Values)”**

Revise UFSAR Table 9.4.1-2 (Sheet 2 of 3), as follows:

<b>Division “B &amp; D” Supply Air Handling Units</b>	
Quantity	2
System capacity per unit (%)	100
<b>Supply Fan Requirements</b>	
Type	Centrifugal
Design airflow (scfm)	<del>14,500</del> <u>10,480</u>
Fan static pressure (in. wg)	6.5
<b>Return Air/Smoke Purge Fan Requirements</b>	
Type	Centrifugal
Design airflow (scfm)	<del>12,600</del> <u>9,790</u>
Fan static pressure (in. wg)	<del>6.0</del> <u>3.0</u>
<b>Cooling Coil Requirements</b>	
Type	Chilled Water
Capacity (Btu/hr)	<del>550,000</del> <u>450,320</u>
Water flow (gpm)	See Table 9.2.7-1
* * *	

**UFSAR Table 9.4.3-1, “Component Data – Radiologically Controlled Area Ventilation System Auxiliary/Annex Building Ventilation Subsystem (Nominal Values)”**

Revise UFSAR Table 9.4.3-1, as follows:

<b>Normal Residual Heat Removal Pump Room Unit Coolers</b>	
* * *	
<b>Cooling Coil Requirements</b>	
Type	Chilled Water
Capacity (Btu/hr)	<del>87,000</del> <a href="#">75,250</a>
Water flow (gpm)	See Table 9.2.7-1
* * *	
<b>Chemical and Volume Control Makeup Pump Room Unit Coolers</b>	
* * *	
<b>Cooling Coil Requirements</b>	
Type	Chilled Water
Capacity (Btu/hr)	<del>127,000</del> <a href="#">113,320</a>
Water flow (gpm)	See Table 9.2.7-1
* * *	