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

SAFETY EVALUATION BY THE OFFICE OF NEW REACTORS

RELATED TO AMENDMENT NOS. 161 AND 159

TO THE COMBINED LICENSE NOS. NPF-91 AND NPF-92, RESPECTIVELY

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

GEORGIA POWER COMPANY

OGLETHORPE POWER CORPORATION

MEAG POWER SPVM, LLC

MEAG POWER SPVJ, LLC

MEAG POWER SPVP, LLC

CITY OF DALTON, GEORGIA

VOGTLE ELECTRIC GENERATING PLANT UNITS 3 AND 4

DOCKET NOS. 52-025 AND 52-026

1.0 INTRODUCTION

By letter dated November 16, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18320A225), as supplemented by letter dated January 24, 2019, (ADAMS Accession No. ML19024A179), the Southern Nuclear Operating Company (SNC), requested that the U.S. Nuclear Regulatory Commission (NRC) amend Vogtle Electric Generating Plant (VEGP) Units 3 and 4, Combined License (COL) Numbers NPF-91 and NPF-92, respectively. The License Amendment Request (LAR) 18-028 requested changes to depart from information in the Updated Final Safety Analysis Report (UFSAR) Tier 2 information (which includes the plant-specific Design Control Document (PS-DCD) Tier 2 information) and involves related changes to plant- specific Tier 1 information, with corresponding changes to the associated COL Appendix C information. The requested amendment proposed changes to reflect revisions in the routing of Class 1E cables associated with the passive containment cooling system (PCS). Additionally, the LAR proposed related consistency revisions in the safe shutdown evaluation divisional separation information.

Pursuant to Section 52.63(b)(1) of Title 10 of the *Code of Federal Regulations* (10 CFR), SNC also requested an exemption from the provisions of 10 CFR Part 52, Appendix D, "Design Certification Rule for the AP1000 Design," Section III.B, "Scope and Contents." The requested exemption would allow a departure from the corresponding portions of the certified information in Tier 1 of the generic DCD.[1] In order to modify the UFSAR (the PS-DCD) Tier 1 information,

[1] While SNC describes the requested exemption as being from Section III.B of 10 CFR Part 52, Appendix D, the entirety of the exemption pertains to proposed departures from Tier 1 information in the PS-DCD.

the NRC must find SNC's exemption request included in its submittal for the LAR to be acceptable. The staff's review of the exemption request, as well as the LAR, is included in this safety evaluation.

The supplement dated January 24, 2019, provided additional information that clarified the application, did not expand the scope of the application as originally noticed and did not change the staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on February 1, 2019 (84 FR 20).

2.0 REGULATORY EVALUATION

The staff considered the following regulatory requirements in reviewing the LAR that included the proposed changes.

Appendix D, Section VIII.A.4 to 10 CFR Part 52 states that exemptions from Tier 1 information are governed by the requirements in 10 CFR 52.63(b)(1) and 10 CFR 52.98(f). It also states that the Commission will deny such a request if it finds that the design change will result in a significant decrease in the level of safety otherwise provided by the design.

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.

10 CFR 52.63(b)(1) allows the licensee who references a design certification rule to request NRC approval for an exemption from one or more elements of the certification information. The Commission may only grant such a request if it determines that the exemption will comply with the requirements of 10 CFR 52.7, which, in turn, points to the requirements listed in 10 CFR 50.12 for specific exemptions. In addition to the factors listed in 10 CFR 52.7, the Commission shall consider whether the special circumstances outweigh any decrease in safety that may result from the reduction in standardization caused by the exemption. Therefore, any exemption from the Tier 1 information certified by Appendix D to 10 CFR Part 52 must meet the requirements of 10 CFR 50.12, 52.7, and 52.63(b)(1).

10 CFR 52.98(f) requires NRC approval for any modification to, addition to, or deletion from the terms and conditions of a COL. These activities involve a change to COL Appendix C ITAAC information, with corresponding changes to the associated PS-DCD Tier 1 information. Therefore, NRC approval is required prior to making the plant specific proposed changes in this LAR.

10 CFR 50.48(a)(1) requires a fire protection plan that satisfies 10 CFR Part 50, Appendix A, General Design Criterion (GDC) 3, "Fire Protection."

10 CFR 50.48(a)(2)(iii) requires the licensee to describe specific features necessary to limit fire damage to structures, systems, or components (SSCs) important to safety so that the capability to shut down the plant safely is ensured.

In the remainder of this evaluation, the NRC will refer to the exemption as an exemption from Tier 1 information to match the language of Section VIII.A.4 of 10 CFR Part 52, Appendix D, which specifically governs the granting of exemptions from Tier 1 information.

10 CFR 50.55a, “Codes and Standards,” requires in 10 CFR 50.55a(h), in part, that safety systems for plants with construction permits issued after May 13, 1999, must meet the requirements of Institute of Electrical and Electronics Engineers (IEEE) Standard (Std.) 603-1991. Section 5.6.1 of IEEE Std. 603-1991 states, “Redundant portions of a safety system provided for a safety function shall be independent of, and physically separated from, each other to the degree necessary to retain the capability of accomplishing the safety function during and following any design basis event requiring that safety function.”

The specific NRC technical requirements applicable to LAR 18-028 are the general design criteria in Appendix A, “General Design Criteria for Nuclear Power Plants,” to 10 CFR Part 50, “Domestic Licensing of Production and Utilization Facilities.” In particular, these technical requirements include the following GDC:

GDC 2, “Design bases for protection against natural phenomena” requires, in part that SSCs important to safety shall be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunami, and seiches without loss of capability to perform their safety functions. The design bases for these SSCs shall reflect: (1) appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated; (2) appropriate combinations of the effects of normal and accident conditions with the effects of the natural phenomena, and (3) the importance of the safety functions to be performed.

GDC 3, “Fire protection” requires, in part, SSCs important to safety to be designed and located to minimize, consistent with other safety requirements, the probability and effect of fires and explosions.

GDC 4, “Environmental and dynamic effects design bases,” requires, in part, that SSCs important to safety shall be designed to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including loss-of-coolant accidents. These SSCs shall be appropriately protected against dynamic effects, including the effects of missiles, pipe whipping, and discharging fluids, that may result from equipment failures and from events and conditions outside the nuclear power unit.

GDC 17, “Electric power systems,” requires, in part, that an onsite electric power system and an offsite electric power system be provided to permit functioning of SSCs important to safety. The onsite electric power distribution system, shall have sufficient independence, redundancy, and testability to perform their safety functions assuming a single failure.

GDC 19, “Control room,” requires in part, that a control room be provided from which actions can be taken to operate the nuclear unit safely under normal conditions and to maintain it in a safe condition during accidents, including loss-of-coolant accidents. Adequate radiation protection should be provided to permit access and occupancy of the control room under accident conditions without personnel receiving radiation exposure in excess of 5 roentgen equivalent man (rem) whole body, or its equivalent to any part of the body for the duration of the accident.

Regulatory Guide (RG) 1.75, “Physical Independence of Electric Systems,” Revision 3, endorses and augments the guidance in IEEE Std. 603-1991, and 384-1992, “IEEE Standard Criteria for Independence of Class 1E Equipment and Circuits.” RG 1.75 describes a method

acceptable to the staff for complying with the NRC's regulations with respect to the physical independence requirements of the circuits and electric equipment that comprise or are associated with safety systems.

3.0 TECHNICAL EVALUATION

3.1 TECHNICAL EVALUATION OF THE REQUESTED CHANGES

3.1.1 TECHNICAL EVALUATION FROM ELECTRICAL ENGINEERING PERSPECTIVE

In LAR 18-028, SNC proposed changes to UFSAR Tier 2 information that involve a change to the COL Appendix C (and plant-specific Tier 1) information in Table 3.3-3, "Class 1E Divisions in Nuclear Island Fire Areas," identifying the Class 1E divisions in specific nuclear island fire areas. Specifically, the licensee proposed revisions associated with Fire Areas 1200 AF 03, 1201 AF 02, 1201 AF 03, 1204 AF 01, 1242 AF 02 and 1250 AF 01, and Tier 1 (and corresponding COL Appendix C) Table 3.3-3. The location of the PCS valve room (Room 12701) remains unchanged from the original review; and therefore, continues to be located near the top of the shield building. The Class 1E direct current (dc) cables that support components located in the PCS valve room were originally intended to be embedded in the shield building walls. SNC has since identified structural interferences with this cable routing that were introduced when the shield building changed from reinforced concrete to modular construction in the enhanced shield building design. The modular design and the associated revised structural elements created an interference with the embedded raceway. As a result, SNC determined that a design change is necessary to reroute the electrical raceways which are intended to support the Class 1E dc and Uninterruptable Power Supply System (IDS) Class 1E cabling for the loads located in the PCS valve room, which consists of Division A, Division B, and Division C, as well as nonsafety raceways. The Class 1E dc power supply location remains unchanged from the original review.

Chases for electrical cables, piping, or ducts that pass through a fire area but are separated from it by 3-hour fire barriers are considered outside that fire area. SNC reviewed each fire area to identify the potential scope of fire damage and to verify that the capability to achieve and maintain safe shutdown is preserved in the event of a fire. These rooms are physically separated from other safety-related divisions by 3-hour fire barriers. Cables of one separation group are run in separate raceways and physically separated from cables of other separation groups. In the event of a fire in one of the rooms in a given fire area, it is assumed that control of all divisional components is lost.

In support of this change, SNC performed an extensive review of the design drawings detailing Class 1E dc Divisions A, B, and C cables routings supporting PCS components to confirm the new routing pathways. The new routing of the Class 1E dc cables supporting PCS components necessitates an update to UFSAR Appendix 9A, "Fire Protection Analysis," and to the Class 1E Divisions in "Nuclear Island Fire Areas" identified in COL Appendix C (and the associated plant-specific Tier 1) Table 3.3-3. COL Appendix C (and the associated plant-specific Tier 1) Table 3.3-3 identifies Class 1E divisions in the nuclear island fire areas, including auxiliary building radiologically controlled areas and non-radiologically controlled areas. Each fire area is listed with the associated divisional cabling that terminates in the related rooms.

The proposed Tier 1 and Tier 2 UFSAR changes described in LAR 18-028 are related to the new routing of selected IDS Class 1E cables that support PCS components. VEGP Units 3 and 4 UFSAR Section 9.5.1.1, "Design Basis," states that the AP1000 plant is designed with

separate redundant safe shutdown components and associated electrical divisions to preserve the capability to safely shut down the plant following a fire. In the LAR, SNC states that the AP1000 Fire Protection Analysis Report was updated to address the new cable raceway routing pathways and documents the design basis supporting UFSAR Appendix 9A. In addition, VEGP Units 3 and 4 UFSAR, Appendix 9A states in part that one purpose of the Fire Protection Analysis is to confirm the capability to safely shutdown the plant following a fire.

VEGP Units 3 and 4 UFSAR Section 3.1.1, "Overall Requirements," states that the safety-related SSCs are designed to withstand the effects of natural phenomena without loss of the capability to perform their safety-related functions. In the LAR, SNC states, in part, that the nuclear island structures (i.e., containment internal structures, shield and auxiliary buildings) are designed to withstand the effects of natural phenomena (e.g., hurricanes, floods, tornados, tsunamis, and earthquakes) and the effects of postulated internal events such as fires and flooding without loss of capability to perform safety functions.

The staff reviewed the licensee's proposed changes to reroute IDS Class 1E cables from the shield building to and within the affected auxiliary building fire areas (including Fire Areas 1200 AF 03, 1201 AF 02, 1201 AF 03, 1204 AF 01, 1242 AF 02, and 1250 AF 01) from an electrical perspective.

GDC 2

The shield and auxiliary buildings are Category I structures that provide protection from the effects of hurricanes, floods, tornados, tsunamis, and earthquakes. These structures were approved as part of the original design. Since the IDS Class 1E cables associated with the proposed changes will be located within these structures, the staff finds that they will remain protected in accordance with GDC 2; and therefore, maintain the ability to perform their safety function.

GDC 4

VEGP Units 3 and 4 UFSAR Section 3.1.1 states that the safety-related SSCs are designed to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including loss of coolant accidents.

According to the LAR, the rerouted cable raceways design continues to meet the environmental conditions for the environmental zones in the auxiliary building through which the cables are to be routed. The raceways penetrate through the shield building below the connection between the shield building and the auxiliary building roof. SNC did not propose any changes to the cable design as the cables remain qualified for the environments of the rooms through which they are proposed to be routed.

On January 10, 2019, the staff requested clarification during a public teleconference. Specifically, the staff requested the licensee to clarify why GDC 4 was not evaluated in the LAR as it relates to the proposed changes. SNC responded to the NRC staff's request in letter dated January 24, 2019. In its response, SNC revised the LAR to include an evaluation of GDC 4. The revisions specifically stated that the Class 1E cables subject to the revised routing are designed to accommodate the environmental conditions and dynamic effects in the areas where they are to be routed. The Class 1E cables were approved as part of the original design to meet GDC 4 with respect to the ability of the SSCs of the Class 1E IDS to withstand the effects

of missiles and environmental conditions associated with normal operation and postulated accidents based on adequate design and equipment qualification.

SNC is also required to conduct inspections, tests or a combination of tests and analysis on the PCS Class 1E components and associated wiring, cables, and terminations located in harsh environments in Table 2.2.2-1 for the completion of Tier 1, Table 2.2.2-3 Inspections, Tests, Analysis, and Acceptance Criteria (ITAAC) No. 6a, to assure that Class 1E components can withstand the environmental conditions that would exist before, during, and following a design basis accident.

In its response to the staff's request, SNC provided some editorial changes to more clearly identify which division (A, B, C or D) the original text was referring to and stated that there are no radiation zone changes or radiological access control changes required because of these proposed changes and that the physical design and operation of the system, as described in the UFSAR, is not changed. According to SNC, the Class 1E cables subject to the revised routing are designed to accommodate the environmental conditions and dynamic effects in the areas where they are to be routed.

Staff, based on its review of the LAR and supplemental letter, finds that the proposed changes will continue to comply with the GDC 4 requirements as the rerouted cables' locations and adjacent locations to which they were moved provided the same level of protection with respect to GDC 4.

GDC 17, Section 50.55a of 10 CFR Part 50, and RG 1.75

VEGP Units 3 and 4 UFSAR Section 8.1.4.1, "Safety Design Basis," states that the separation criteria preserve the independence of redundant Class 1E circuits as described in Subsection 8.3.2.4, "Independence of Redundant Systems," and that no single credible event is capable of disabling redundant safety-related systems. UFSAR Subsection 8.3.2.4, further states in part that raceways from a separation group routed in the same areas as the other safety-related groups are separated according to spatial separation stipulated in RG 1.75. RG 1.75, Revision 3, endorses and augments the guidance in IEEE Stds. 603-1991 and 384-1992. IEEE Std. 603-1991 establishes minimum functional design criteria for the power, instrumentation, and control portions of nuclear power generating station safety systems. The criteria are to be applied to those systems required to protect the public health and safety by functioning to mitigate the consequences of design basis events. IEEE Std. 384-1992 provides guidance and criteria for achieving independence of redundant electrical circuits and equipment comprising or associated with Class 1E systems by physical separation and electrical isolation. SNC noted that the changes to raceway and cable routings remain consistent with the existing routing and separation descriptions in the applicable subsections of UFSAR Section 8.3.

With regards to Fire Area 1200 AF 03, SNC proposed removing the IDS Class 1E Division B and D cables from Fire Area 1200 AF 03 and adding IDS Class 1E Divisions A and C cables due to the revised routing of the Class 1E cables. SNC also proposed revising Tier 1, Table 3.3-3, the safe shutdown evaluation description in UFSAR Appendix 9A, Subsection 9A.3.1.2.8.6, "Fire Area 1200 AF 03," and UFSAR Table 9A-2, "Safe Shutdown Components," to reflect the change in divisions. In the LAR, SNC stated, in part, that divisional cabling is now routed in Room 12411 and adds additional cables to both Room 12311 and 12411, and that the Fire Protection Analysis Report is revised to reflect the revised routing. Based on the review of the LAR, the staff finds that the proposed addition of the IDS Class 1E Divisions A and C cables will not affect the redundant safe shutdown components in other fire areas because the

redundant divisional cables will be located in the adjacent fire areas and separated from the other safety-related equipment by 3-hour fire barriers as stated in UFSAR Tier 2 Subsection 9A.3.1.2.8.6.

With regards to Fire Area 1201 AF 02, SNC proposed adding Division D conduit and cables associated with the Main Control Room (MCR)/Remote Shutdown Room transfer switch function in Fire Area 1201 AF 02 in support of the revised routing of the IDS Class 1E cables. SNC also proposed to revise Tier 1, Table 3.3-3 and the safe shutdown evaluation description in UFSAR Appendix 9A, Subsection 9A.3.1.2.2.1, "Fire Area 1201 AF 02," to reflect the Division D cable routing in Fire Area 1201 AF 02. In the LAR, SNC stated, in part, that the revised routing adds additional cables to both Room 12204 and 12304. Based on its review of the LAR, the staff finds that the proposed rerouting and addition of the IDS Class 1E Division D cables will not affect the redundant safe shutdown components in other fire areas because the redundant divisional cables will be located in the adjacent fire areas and separated from the other safety-related equipment by 3-hour fire barriers, as stated in UFSAR Tier 2 Subsection 9A.3.1.2.2.1.

With regards to Fire Area 1201 AF 03, SNC proposed adding IDS Class 1E Division B cables in Fire Area 1201 AF 03, revising Tier 1, Table 3.3-3, and the safe shutdown evaluation description in UFSAR Appendix 9A, Subsection 9A.3.1.2.4.1, "Fire Area 1201 AF 03," in support of the revised routing of the IDS Class 1E Division B cables in this fire area. Based on its review of the LAR, the staff finds that the proposed rerouting and addition of the IDS Class 1E Divisions B cables will not affect the redundant safe shutdown components in other fire areas because the redundant divisional cables will be located in the adjacent fire areas and separated from the other safety-related equipment, by 3-hour fire barriers, as stated in UFSAR Tier 2 Subsection 9A.3.1.2.4.1.

With regards to Fire Area 1204 AF 01, SNC proposed deleting Fire Area 1204 AF 01 from Tier 1, Table 3.3-3 and revising UFSAR Appendix 9A, Subsection 9A.3.1.3.1.3, "Fire Area 1204 AF 01," to account for the deletion of Fire Area 1204 AF 01. SNC proposed deleting Fire Area 1204 AF 01 because of the discrepancy between UFSAR Subsection 9A.3.1.3.1.3. Currently, UFSAR Subsection 9A.3.1.3.1.3 indicates that safe shutdown components are located in Fire Area 1204 AF 01, while UFSAR Table 9A-2 accurately reflects that there are no safe shutdown components located in this fire area. The staff's review of the LAR confirmed that there are no safe shutdown components located in Fire Area 1204 AF 01; and therefore, finds that the proposed changes to delete Fire Area 1204 AF 01 from Tier 1, Table 3.3-3 and the revision to Subsection 9A.3.1.3.1.3 are acceptable.

With regards to Fire Area 1242 AF 02, SNC proposed including the IDS Class 1E Division C cables along with the existing Division A cables in Fire Area 1242 AF 02, and revising Tier 1, Table 3.3-3 and the UFSAR Appendix 9A, Subsection 9A.3.1.2.1.2, "Fire Area 1242 AF 02," safe shutdown evaluation description in support of the revised routing of the IDS Class 1E Division C cables in Fire Area 1242 AF 02. Based on its review of the LAR, the staff finds that the proposed rerouting and addition of the IDS Class 1E Divisions C cables will not affect the redundant safe shutdown components in other fire areas because the redundant divisional cables will be located in the adjacent fire areas and separated from the other safety-related equipment, by 3-hour fire barriers, as stated in UFSAR Tier 2 Subsection 9A.3.1.2.1.2.

With regards to Fire Area 1250 AF 01, SNC proposed adding IDS Class 1E Division A and C cables in Fire Area 1250 AF 01 and IDS Divisions A and C Class 1E cables as safe shutdown components to UFSAR Table 9A-2 in support of the revised routing of the Class 1E cables. The proposed changes would result in revisions to Tier 1, Table 3.3-3, UFSAR Appendix 9A,

Subsection 9A.3.1.2.7.4, “Fire Area 1250 AF 01,” and UFSAR Table 3.7.3-1 to include Fire Area 1250 AF 01. Based on its review of the LAR, the staff finds that the proposed rerouting and addition of the IDS Class 1E Divisions A and C cables will not affect the redundant safe shutdown components in other fire areas because the redundant divisional cables will be located in the adjacent fire areas and separated from the other safety-related equipment, by 3-hour fire barriers, as stated in UFSAR Tier 2 Subsection 9A.3.1.2.7.4.

In addition, SNC is required to conduct inspections of the as-built Class 1E divisional cables and raceways for the completion of Tier 1, Table 3.3-6, ITAAC No. 7b, to assure that Class 1E divisional electrical cables associated with each division are routed in their respective divisional raceways. SNC is also required to conduct inspections of the as-built Class 1E division electrical cables, raceways, and fire barriers located in the fire areas identified in Table 3.3-3 for the completion of Tier 1, Table 3.3-6 ITAAC No. 7c, to assure that separation is maintained between Class 1E divisions in accordance with the fire areas as identified in Table 3.3-3. Additionally, SNC is required to conduct testing on the IDS for each Class 1E division for completion of Tier 1, Table 2.6.3-3, ITAAC No. 4a, to assure that the IDS provides electrical independence between Class 1E divisions.

Based on its review of the fire areas affected by this LAR, the staff finds that the rerouting and addition of the Class 1E cables and raceways described above will continue to maintain the isolation and physical separation, as well as, independence and redundancy (as described in UFSAR Section 8.3) as required by GDC 17 and Section 50.55a of 10 CFR Part 50, and is consistent with the guidance provided in RG 1.75.

3.1.1.1 SUMMARY OF TECHNICAL EVALUATION FROM ELECTRICAL ENGINEERING PERSPECTIVE

In LAR 18-028, SNC proposed changes that would affect the Appendix C of the COL, corresponding plant-specific Tier 1 information, as well as the UFSAR. The NRC documented its review of the above changes in this section of this safety evaluation and finds the changes acceptable in accordance with 10 CFR 50, Appendix A, GDCs 2, 4, and 17, Section 50.55a of 10 CFR Part 50, and the guidance provided in RG 1.75.

3.1.2 TECHNICAL EVALUATION FROM FIRE PROTECTION PERSPECTIVE

As described in the VEGP Units 3 and 4 UFSAR, Revision 6, the primary objectives of the VEGP Units 3 and 4 fire protection program are to prevent fires and to minimize the consequences should a fire occur. The program provides protection so that the plant can be shut down safely following a fire.

The staff has reviewed the analysis provided in LAR 18-028. SNC stated that the proposed rerouting of the Class 1E dc cables supporting PCS components would necessitate an update to the following Fire Areas:

- 1204 AF 01
- 1200 AF 03
- 1201 AF 02
- 1201 AF 03
- 1242 AF 02
- 1250 AF 01

The changes made in these fire areas impact the following sections of the UFSAR:

- UFSAR Section 9.5.1.2.1.1, “Plant Fire Prevention and Control Features”
- UFSAR Appendix 9A, “Fire Protection Analysis”
- UFSAR Table 9A-2, which lists the safety-related components used for safe shutdown and their associated electrical divisions for each fire area.
- UFSAR Table 9A-3, “Fire Protection Summary,” identifies the type and quantity of combustible materials in each fire area along with fire detection and suppression features.
- UFSAR Table 9A-4, “Ventilation Systems Serving Fire Areas Containing Class 1E Equipment,” identifies the ventilation systems serving fire areas containing Class 1E electrical components.
- Class 1E Divisions in Nuclear Island Fire Areas identified in COL Appendix C and the associated plant-specific Tier 1 Table 3.3-3.

Evaluation of proposed changes in Fire Area 1204 AF 01

SNC stated that contrary to the safe shutdown evaluation in UFSAR Section 9A.3.1.3.1.3, a review of the design confirmed that there are no safe shutdown components located in Fire Area 1204 AF 01. Due to this, a consistency change is made to COL Appendix C Table 3.3-3 to delete the row for Fire Area 1204 AF 01 which only contains non-Class 1E divisions. With the removal of Fire Area 1204 AF 01 from COL Appendix C Table 3.3-3, there is no longer a requirement for the testing of individual fire detectors in this fire area as part of ITAAC in COL Appendix C Item 2.3.04.10. However, testing of the as-built individual fire detectors in this fire area continues to be performed, as required by National Fire Protection Association’s (NFPA) 72, “National Fire Alarm Code,” just not as part of the safe shutdown related ITAAC. SNC stated that there is no adverse impact to the fire detection capability in Fire Area 1204 AF 01 as a result of the removal of this fire area from COL Appendix C Table 3.3-3.

Because Fire Area 1204 AF 01 has no safe shutdown components and the fire detectors in this fire area will be tested according to NFPA 72, the staff finds the proposed change acceptable.

Evaluation of proposed changes in Fire Area 1200 AF 03, Rooms 12311 and 12411

Due to the proposed rerouting of the Class 1E cables, SNC proposed the following changes:

- UFSAR Section 9A.3.1.2.8.6 is revised to remove Division B and D cables and to include Division A and C cables consistent with the revised routing.

- UFSAR Table 9A-2 is revised to remove Divisions B and D cables and to include Divisions A and C cables consistent with the revised routing.

- The revised routing also adds additional cables to Rooms 12311 and 12411, both of which are in Fire Area 1200 AF 03. Therefore, the combustible material loading in UFSAR Table 9A-3 is revised for these rooms.

- UFSAR Table 9A-4 is revised to move Fire Area 1200 AF 03 from the portion of the table addressing ventilation systems serving fire areas containing Division B and D components to that portion of the table addressing ventilation systems serving fire areas containing Division A and C components.

- COL Appendix C Table 3.3-3, is revised to remove Divisions B and D cables and to include

Divisions A and C cables consistent with the revised routing.

The staff reviewed the proposed changes to UFSAR Section 9A.3.1.2.8.6, UFSAR Table 9A-2, UFSAR Table 9A-4, and COL Appendix C Table 3.3-3, and finds them acceptable because the Divisions B and D cables which are located in a separate fire area are sufficient to perform the applicable functions and maintain safe shutdown in the event of a fire in Fire Area 1200 AF 03. The staff also reviewed the combustible loading changes proposed by SNC in UFSAR Table 9A-3 and finds it acceptable because the additional loading does not change the overall results of the fire protection evaluation.

Evaluation of proposed changes in Fire Area 1201 AF 02, Rooms 12204 and 12304

Due to the proposed rerouting of the Class 1E cables, SNC proposed the following changes:

- UFSAR Section 9A.3.1.2.2.1 safe shutdown evaluation text is revised to include the Division D cables.
- The revised routing also adds additional cables to Rooms 12204 and 12304, both of which are in Fire Area 1201 AF 02. Therefore, the combustible material loading in UFSAR Table 9A-3 is revised for these rooms.
- UFSAR Table 9A-4 is revised to include Divisions A, B, C, D interdivisional cables as indicated in COL Appendix C Table 3.3-3.
- COL Appendix C Table 3.3-3 is revised to include the Division D cables.

SNC stated that UFSAR Table 9A-2 lists the Division B safe shutdown components that are located in this fire area. The Division B electrical rooms are physically separated from the other safety-related divisions and the equipment that is not safety-related by 3-hour fire barriers. SNC also stated that there is a Division D conduit that traverses Fire Area 1201 AF 02. The cables in this conduit are associated with the MCR/Remote Shutdown Room transfer switch function. The habitability of the MCR is not affected by a postulated fire in this area and the affected cables cannot cause or prevent Division D components from functioning. These cables are Class 1E cables, however they perform a non-Class 1E function, therefore no update to UFSAR Table 9A-2 is required.

The staff reviewed the proposed changes to UFSAR Section 9A.3.1.2.2.1, UFSAR Table 9A-4, COL Appendix C Table 3.3-3, and finds them acceptable because the addition of the Division D cable does not change the safe shutdown evaluation for Fire Area 1201 AF 02. The staff finds that no update is needed to UFSAR Table 9A-2 because the Division D cables perform a non-Class1E function. The staff also reviewed the combustible loading changes proposed by the licensee in UFSAR Table 9A-3 and finds it acceptable because the additional loading does not change the overall results of the fire protection evaluation.

Evaluation of proposed changes in Fire Area 1201 AF 03, Room 12305

Due to the proposed rerouting of the Class 1E cables, SNC proposed the following changes to the UFSAR:

- UFSAR Section 9A.3.1.2.4.1 safe shutdown evaluation text is revised to include the Division B cables.

- The revised routing also adds additional cables to Room 12305 which is in Fire Area 1201 AF 03. Therefore, the combustible material loading in UFSAR Table 9A-3 is revised for this room.

- UFSAR Table 9A-4 is revised to include the Division B and D cables, and Divisions A, B, C, D interdivisional cables as indicated in COL Appendix C Table 3.3-3.

- COL Appendix C Table 3.3-3 is revised to include Division B cables consistent with the revised routing.

SNC stated that the Division D electrical rooms in this fire area are physically separated from safety-related Divisions A and C by 3-hour fire barriers. Because of the physical separation, a fire does not adversely affect the other safety-related electrical divisions with the exception of the Division B components located in Fire Zone 1270 AF 12701. For this event, the Divisions A and C components identified in UFSAR Table 9A-2 are sufficient to achieve and maintain safe shutdown.

The staff reviewed the proposed changes to UFSAR Section 9A.3.1.2.4.1, UFSAR Table 9A-4, and COL Appendix C Table 3.3-3, and finds them acceptable because the Division A and C components are sufficient to achieve and maintain safe shutdown in the event of a fire in Fire Area AF 1201 AF 03. The staff also reviewed the combustible loading changes proposed by the licensee in UFSAR Table 9A-3 and finds it acceptable because the additional loading does not change the overall results of the fire protection evaluation.

Evaluation of Proposed Changes in Fire Area 1242 AF 02, Room 12412

Due to the proposed rerouting of the Class 1E cables, SNC proposed the following changes to the UFSAR:

- UFSAR Section 9A.3.1.2.1.2 safe shutdown evaluation text is revised to include the Division C cables.
- UFSAR Table 9A-2 is revised to include Division A and C cables consistent with the revised routing.
- The revised routing also adds additional cables to Room 12412 which is in Fire Area 1242 AF 02. Therefore, the combustible material loading in UFSAR Table 9A-3 is revised for this room.
- UFSAR Table 9A-4 is revised to include the Divisions A and C cables.
- COL Appendix C Table 3.3-3 is revised to include Division C cables consistent with the revised routing.
- An additional editorial change to add a dash in the Division D column is also made in COL Appendix C Table 3.3-3 for consistency with the UFSAR Section 9A.3.1.2.1.2 safe shutdown evaluation.

SNC stated that the Division A penetration room is physically separated from the other safety-related divisions and equipment that is not safety-related by 3-hour fire barriers. In the event of a fire it is assumed that control of all Divisions A and C active components is lost. Because of the physical separation, the fire does not adversely affect the other safety-related electrical divisions. In the event of a fire, the Divisions B and D components identified in UFSAR Table 9A-2 are sufficient to achieve and maintain safe shutdown.

In addition, Division C electrical cables that serve the redundant PCS valves and instruments located in the PCS valve room are routed through this fire area. In the event of a fire, it is also

assumed that this division is disabled. The remaining Division B electrical cables and components routed through and located in other fire areas are sufficient to perform the applicable functions to achieve and maintain safe shutdown.

The staff reviewed the proposed changes to UFSAR Section 9A.3.1.2.1.2, UFSAR Table 9A-2, UFSAR Table 9A-4, and COL Appendix C Table 3.3-3 and finds them acceptable because the Divisions B and D components which are located in a separate fire area are sufficient to perform the applicable functions and main safe shutdown in the event of a fire in Fire Area 1242 AF 02.

The staff reviewed the licensee's editorial changes provided in the LAR and finds them acceptable because the changes are editorial in nature and do not revise any fire area barriers.

Evaluation of proposed changes in Fire Area 1250 AF 01 Room 12501

Due to the proposed rerouting of the Class 1E cables, SNC proposed the following changes to the UFSAR:

- UFSAR Section 9A.3.1.2.7.4 is revised to include Divisions A and C cables consistent with the revised routing.
- Consistent with the proposed revision to UFSAR Section 9A.3.1.2.7.4 for the addition of safe shutdown Class 1E cabling in Fire Area 1250 AF 01, a consistency change is needed to UFSAR Section 9.5.1.2.1.1 since safe shutdown components are now included in Room 12501.
- The revised routing also adds additional cables to Room 12501, which is in Fire Area 1250 AF 01. Therefore, the combustible material information in UFSAR Table 9A-3 is revised for this room.
- UFSAR Table 9A-4 is revised to include Fire Area 1250 AF 01 and the Divisions A and C cables.
- COL Appendix C Table 3.3-3 is revised to include Fire Area 1250 AF 01 and the Divisions A and C cables.

SNC stated that the safe shutdown components routed through this fire area are Divisions A and Division C electrical cables that serve the redundant PCS valves and instruments located in the PCS valve room. A fire in this fire area is assumed to disable both the Division A and Division C electrical cables that serve the PCS valves and instruments for safe shutdown. The remaining Division B electrical cables and components routed through and located in other fire areas are sufficient to perform the applicable functions to achieve and maintain safe shutdown.

The staff reviewed the proposed changes to UFSAR Section 9A.3.1.2.7.4, UFSAR Section 9.5.1.2.1.1, UFSAR Table 9A-4, and COL Appendix C Table 3.3-3 and finds them acceptable because the Division B electrical cables and components routed through and located in other fire areas are sufficient to perform the applicable functions to achieve and maintain safe shutdown.

3.1.2.1 SUMMARY OF TECHNICAL EVALUATION FROM FIRE PROTECTION PERSPECTIVE

Based on these findings the staff concludes that there is reasonable assurance that the requirements of 10 CFR 50.48(a)(1), 10 CFR 50.48(a)(2)(iii), and GDC 3 will continue to be met. Therefore, the NRC staff finds the proposed changes acceptable.

3.1.3 TECHNICAL EVALUATION FROM RADIATION PROTECTION PERSPECTIVE

The staff reviewed LAR 18-028, including the associated supplements. The LAR included the addition of 16 small electrical penetrations through the concrete wall between the shield building annulus and the auxiliary building in Rooms 12501 and 12506. The LAR also included running electrical cabling through several additional areas in the auxiliary building. Since the changes had the potential to impact post-accident vital area mission doses and the doses to the MCR, the staff evaluated the changes in accordance with 10 CFR 50.34(f)(2)(vii) and GDC 19.

In the LAR, SNC specified that they performed sensitivity studies to determine the potential dose rate impacts of the penetrations. Based on these studies, SNC determined that the penetrations are not a significant contributor to the reported post-accident dose rates in these rooms, compared to the more significant radiation sources affecting these areas. SNC also specified that there were no radiation zone changes due to the changes made in the LAR and that there are no changes to the MCR dose evaluations as the penetrations do not provide a straight through radiation streaming path to the MCR. SNC also specified that there are no significant changes to the total doses for post-accident vital area missions.

During its review, the staff identified that Room 12506 had been previously identified as radiation Zone 8 (100 radiation absorbed dose (rad/hour to 500 rad/hour)) during post-accident conditions. The room contains main steam piping. The main steam piping and associated penetrations would be expected to be a much larger contributor to the post-accident doses to this room than the small electrical penetrations being added. There are no identified post-accident vital area missions in Room 12506, nor to the surrounding rooms. Therefore, the staff concludes that the additional penetrations to Room 12506 would not be of radiological significance.

The staff also identified that Room 12501 had been previously identified as radiation Zone 6 (1 rem/hour to 10 rem/hour) during post-accident conditions. Room 12501 is directly above the MCR and contains the MCR ventilation system filters, which are assumed to be a significant radiation source during post-accident conditions. Room 12501 is identified as a vital area during post-accident conditions and may require access in order to properly configure the MCR emergency habitability system during accident conditions. The electrical penetrations being added to Room 12501 are small and SNC indicated that they performed a sensitivity study that showed that the dose from radiation streaming through the penetrations is not a significant source of radiation exposure to the room when compared to other radiation sources. In addition, SNC indicated that the post-accident vital mission doses remain below 5 rem, and that there were no changes to any radiation zones. Since, 1) the penetrations are small; 2) the filters are already a significant post-accident radiation source in Room 12501; and 3) SNC's sensitivity analysis indicated that the radiation zones are not affected and that the post-accident mission doses remain below 5 rem, the staff finds that the added penetrations to Room 12501 would not result in a significant radiological impact As a result, the staff finds the added penetrations to Room 12501 to be acceptable, due to the location of the penetrations for the cables, and the associated radiation streaming, with respect to the locations of the identified vital area mission paths and the location of dose receptor points, such as the Main Control Room.

3.1.3.1 SUMMARY OF TECHNICAL EVALUATION FROM RADIATION PROTECTION PERSPECTIVE

The staff determined that since the changes made in the LAR do not provide a direct radiation streaming path to the MCR or impact the dose analysis for the MCR or other areas requiring post-accident vital area access, the LAR is acceptable as it relates to MCR dose and vital area access. As a result of the above, the staff finds the changes made in the LAR to be in accordance with 10 CFR 50.34(f)(2)(vii) and GDC 19 and are therefore acceptable.

3.2 EVALUATION OF EXEMPTION

The regulations in Section III.B of Appendix D to 10 CFR Part 52 require a holder of a COL referencing Appendix D to 10 CFR Part 52 to incorporate by reference and comply with the requirements of Appendix D, including certified information in Tier 1 of the generic AP1000 DCD. Exemptions from Tier 1 information are governed by the change process in Section VIII.A.4 of Appendix D of 10 CFR Part 52. Because SNC has identified changes to plant-specific Tier 1 information, with corresponding changes to the associated COL Appendix C information resulting in the need for a departure, an exemption from the certified design information within plant-specific Tier 1 material is required to implement the LAR.

The Tier 1 information for which a plant-specific departure and exemption was requested is described above. The result of this exemption would be that SNC could implement modifications to Tier 1 information to the UFSAR (as well as the plant-specific DCD Tier 2 information) which involves related changes to plant-specific Tier 1 information with corresponding changes to the 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 requested for the involved Tier 1 information described and justified in LAR 18-028. This exemption is a permanent exemption limited in scope to the particular Tier 1 information specified.

As stated in Section VIII.A.4 of Appendix D to 10 CFR Part 52, an exemption from Tier 1 information is governed by the requirements of 10 CFR 52.63(b)(1) and 52.98(f). Additionally, Section VIII.A.4 of Appendix D to 10 CFR Part 52 provides that the Commission will deny a request for an exemption from Tier 1 if it finds that the requested change will result in a significant decrease in the level of safety otherwise provided by the design. Pursuant to 10 CFR 52.63(b)(1), the Commission may grant exemptions from one or more elements of the certification information, so long as the criteria given in 10 CFR 52.7, which, in turn, references 10 CFR 50.12, are met and that the special circumstances, which are defined by 10 CFR 50.12(a)(2), outweigh any potential decrease in safety due to reduced standardization.

Pursuant to 10 CFR 52.7, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 52. As 10 CFR 52.7 further states, the Commission's consideration will be governed by 10 CFR 50.12, "Specific exemptions," which states that an exemption may be granted when: (1) the exemptions are authorized by law, will not present an undue risk to the public health and safety, and are consistent with the common defense and security; and (2) special circumstances are present. Specifically, 10 CFR 50.12(a)(2) lists six circumstances for which an exemption may be granted. It is necessary for one of these bases to be present in order for the NRC to consider granting an exemption request. SNC stated that the requested exemption meets the special circumstances of 10 CFR 50.12(a)(2). That subparagraph defines special

circumstances as when "[a]pplication 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 staff's analysis of these findings is presented below.

3.2.1 AUTHORIZED BY LAW

The requested exemption would allow SNC to implement the amendment described above. This exemption is a permanent exemption limited in scope to particular Tier 1 information. Subsequent changes to this plant-specific Tier 1 information, and corresponding changes to Appendix C, or any other Tier 1 information would be subject to the exemption process specified in Section VIII.A.4 of Appendix D to 10 CFR Part 52 and the requirements of 10 CFR 52.63(b)(1). As stated above, 10 CFR Part 52, Appendix D, Section VIII.A.4 allows the NRC to grant exemptions from one or more elements of the Tier 1 information. The staff has determined that granting of SNC's proposed exemption will not result in a violation of the Atomic Energy Act of 1954, as amended, or the Commission's regulations. Therefore, as required by 10 CFR 50.12(a)(1), the exemption is authorized by law.

3.2.2 NO UNDUE RISK TO PUBLIC HEALTH AND SAFETY

As discussed above in the technical evaluation, the proposed changes comply with the NRC's substantive safety regulations. Therefore there is no undue risk to the public health and safety.

3.2.3 CONSISTENT WITH COMMON DEFENSE AND SECURITY

The proposed exemption would allow changes as described above in the technical evaluation, thereby departing from the AP1000 certified (Tier 1) design information. The change does not alter or impede the design, function, or operation of any plant structures, systems, or components associated with the facility's physical or cyber security and, therefore, does not affect any plant equipment that is necessary to maintain a safe and secure plant status. In addition, the changes have no impact on plant security or safeguards. Therefore, as required by 10 CFR 50.12(a)(1), the staff finds that the common defense and security is not impacted by this exemption.

3.2.4 SPECIAL CIRCUMSTANCES

Special circumstances, in accordance with 10 CFR 50.12(a)(2), are present, in part, whenever 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 underlying purpose of the Tier 1 information is to ensure that a licensee will safely construct and operate a plant based on the certified information found in the AP1000 DCD, which was incorporated by reference into the VEGP Units 3 and 4 licensing basis. The proposed changes described in the above technical evaluation do not impact the ability of any SSCs to perform their functions or negatively impact safety.

Special circumstances are present in the particular circumstances discussed in LAR 18-028 because the application of the specified Tier 1 information is not necessary to achieve the underlying purpose of the rule. The proposed changes are equal or provide additional clarity to the existing requirement. The proposed changes do not affect any function or feature used for the prevention and mitigation of accidents or their safety analyses, and no safety-related SSC or function is involved. This exemption request and associated revisions to the Tier 1 information and corresponding changes to Appendix C demonstrate that the applicable regulatory

requirements will continue to be met. Therefore, for the above reasons, the staff finds that the special circumstances required by 10 CFR 50.12(a)(2)(ii) for the granting of an exemption from the Tier 1 information exist.

3.2.5 SPECIAL CIRCUMSTANCES OUTWEIGH REDUCED STANDARDIZATION

This exemption would allow the implementation of changes to Tier 1 information in the plant-specific DCD and corresponding changes to Appendix C that are being proposed in the LAR. The justification provided in LAR 18-028, the 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. The design functions of the system associated with this request will continue to be maintained because the associated revisions to the Tier 1 information support the design function of the PCS. Consequently, the safety impact that may result from any reduction in standardization is minimized, because the proposed design change does not result in a reduction in the level of safety. Based on the foregoing reasons, as required by 10 CFR Part 52.63(b)(1), the staff finds that the special circumstances outweigh any decrease in safety that may result from the reduction of standardization of the AP1000 design.

3.2.6 NO SIGNIFICANT REDUCTION IN SAFETY

This exemption would allow the implementation of changes discussed above. The exemption request proposes to depart from the certified design by allowing changes discussed above in the technical evaluation. The changes for consistency will not impact the functional capabilities of this system. The proposed changes will not adversely affect the ability of the PCS to perform its design functions, and the level of safety provided by the current systems and equipment therein is unchanged. Therefore, based on the foregoing reasons and as required by 10 CFR 52.7, 10 CFR 52.98(f), and 10 CFR Part 52, Appendix D, Section VIII.A.4, the staff finds that granting the exemption would not result in a significant decrease in the level of safety otherwise provided by the design.

4.0 STATE CONSULTATION.

In accordance with the Commission's regulations, the Georgia State official was notified of the proposed issuance of the amendment on April 19, 2019. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding as published in the *Federal Register* on February 1, 2019 (84 FR 20). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

Because the exemption is necessary to allow the changes proposed in the license amendment, and because the exemption does not authorize any activities other than those proposed in the license amendment, the environmental consideration for the exemption is identical to that of the license amendment. Accordingly, the 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), no environmental impact statement or environmental assessment needs to be prepared in connection with the issuance of the exemption.

6.0 CONCLUSION

The staff has determined that pursuant to Section VIII.A.4 of Appendix D to 10 CFR Part 52, the exemption (1) is authorized by law, (2) presents no undue risk to the public health and safety, (3) is consistent with the common defense and security, (4) presents special circumstances, and (5) does not reduce the level of safety at SNC's facility. Therefore, the staff grants SNC an exemption from the Tier 1 information requested by the licensee.

The staff has concluded, based on the considerations discussed in Section 3.1 that there is reasonable assurance that: (1) the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public. Therefore, the staff finds the changes proposed in this license amendment acceptable.

7.0 REFERENCES

1. Vogtle Electric Generating Plant Units 3 and 4 (LAR 18-028), Request for License Amendment and Exemption: Routing Class 1E Divisional Cables Supporting Passive Containment Cooling, dated November 16, 2018 (ADAMS Accession No. ML18320A225).

2. Vogtle Electric Generating Plant Units 3 and 4 (LAR 18-028S1), Supplement to Request for License Amendment and Exemption: Routing of Class 1E Divisional Cables Supporting Passive Containment Cooling, dated January 24, 2019 (ADAMS Accession No. ML19024A179).

3. Vogtle Electric Generating Plant Units 3 and 4, "Updated Final Safety Analysis Report, Revision 7, and Tier 1 Revision 6," dated June 15, 2018 (ADAMS Accession No. ML18179A227).

4. AP1000 Design Control Document, Revision 19, dated June 13, 2011 (ADAMS Accession No. ML11171A500).

5. Combined License NPF-91, Vogtle Electric Generating Plant Unit 3 (ADAMS Assession No. ML14100A106).

6. Combined License NPF-92 Vogtle Electric Generating Plant Units 4 (ADAMS Assession No. ML14100A135).

7. Regulatory Guide 1.75, "Criteria for Independence of Electrical Safety Systems," (ADAMS Accession No. ML043630448).

8. IEEE Standard 603-1991 – Section 5.6.1 “Criteria for Safety Systems for Nuclear Power Generating Stations”

9. IEEE Standard 384-1992, “Criteria for Independence of Class 1E Equipment and Circuits.”

10. National Fire Protection Association’s (NFPA) 72, “National Fire Alarm Code”