



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

SAFETY EVALUATION BY THE OFFICE OF NEW REACTORS
RELATED TO AMENDMENT NOS. 139 AND 138
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 April 6, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18096B463), the Southern Nuclear Operating Company (SNC) submitted a license amendment request (LAR). LAR 18-001 requested U.S. Nuclear Regulatory Commission (NRC or the Commission) approval for amendments to Combined License (COL) Nos. NPF-91 and NPF-92 for the Vogtle Electric Generating Plant (VEGP), Units 3 and 4, respectively, regarding changes to the equipment survivability assessment requirements associated with hydrogen burns during beyond design basis accidents.

The LAR 18-001 requested changes to the Updated Final Safety Analysis Report (UFSAR) in the form of departures from the incorporated plant-specific Design Control Document (DCD) Tier 2 information and related changes to the VEGP Units 3 and 4 COL and COL Appendix C (and corresponding plant-specific DCD Tier 1) information. Specifically, the requested amendment includes changes to the equipment survivability assessment requirements associated with hydrogen burns during beyond design basis accidents as described in the licensing basis documents, including COL Condition 2.D.(12)(g)9 and plant-specific Tier 1 Sections 2.2.3 and 2.3.9.

Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 52.63(b)(1), 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." This exemption

request will 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 plant-specific design control document (PS-DCD)) Tier 1 information, the NRC must find the licensee'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.

2.0 REGULATORY EVALUATION

LAR 18-001 proposes to change the locations of Hydrogen Igniters 30, 35, 36, 37, and 38 (to meet igniter location criteria specified in the UFSAR), to the location of Hydrogen Igniter 27 (for consistency), and some location details of Hydrogen Igniters 9, 10, 15, and 16 (for clarity). The LAR proposes to consolidate COL Appendix C and plant-specific Tier 1 Table 2.2.3-4, Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC)) 2.2.03.09c with COL Condition 2.D.(12)(g)9, and revise COL Condition 2.D.(12)(g)9 to replace the reference to APP-GW-GLR-069 with new UFSAR Tables 19D-8 and 19D-9 in UFSAR Appendix 19D. The changes revise and add to the equipment on which the equipment survivability assessment is performed to include equipment revised or added to the design since the issuance of the COL. Tier 1 information is defined in 10 CFR Part 52, Appendix D Section II.D.

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

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

10 CFR Part 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.

10 CFR 50.44(c), "Requirements for future water-cooled reactor applicants and licensees," as it relates to pressurized-water reactor plants being designed to accommodate hydrogen generation equivalent to 100 percent fuel clad-coolant reaction while limiting containment hydrogen to less than 10 percent and maintain containment structural integrity and appropriate accident mitigating features; and the capability to ensure a mixed atmosphere during design-basis and significant beyond design basis accidents.

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

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 generic DCD. 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 50.12 for specific exemptions. In addition to the factors listed in 10 CFR 52.7, the Commission shall consider whether the special circumstances present 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 plant-specific DCD Tier 1 information. Therefore, NRC approval is required prior to making the plant-specific proposed changes in this LAR.

10 CFR Part 50, Appendix A, General Design Criteria (GDC) 41, "Containment atmosphere cleanup," as it relates to systems being provided to control the concentration of hydrogen or oxygen that may be released into the reactor containment following postulated accidents to ensure that containment integrity is maintained. Systems shall be designed to suitable requirements: suitable redundancy in components and features, and suitable interconnections shall be provided to ensure that for either a loss of onsite or a loss of offsite power, the system safety function can be accomplished, assuming a single failure. Systems shall be provided with suitable leak detection, isolation, and containment capability to ensure that the system safety function can be accomplished.

3.0 TECHNICAL EVALUATION

3.1 TECHNICAL EVALUATION OF THE REQUESTED CHANGES

In LAR 18-001, SNC proposes to depart from Tier 2 information in the approved AP1000 DCD. The AP1000 DCD is incorporated into the VEGP Units 3 and 4 UFSAR. The licensee is adding PS-DCD information, which also involves changes to COL Appendix C (and associated plant-specific information in Tier 1).

Specifically, LAR 18-001 includes the following changes related to Hydrogen Igniters:

- Relocation of hydrogen igniter 30
- Relocation and elevation of hydrogen igniters 35, 36, 37, and 38
- Changes to hydrogen igniter 27 room number and elevation details
- Changes to hydrogen igniters 9, 10, 15, 16 location details

LAR 18-001 also proposes to consolidate COL Appendix C (and plant-specific Tier 1 Table 2.2.3-4, ITAAC 2.2.03.09c) with COL Condition 2.D.(12)(g)9. The ITAAC and the license condition address the same list of equipment, specified in a technical report APP-GW-VP-025, "AP1000 Equipment Survivability Assessment," which is Attachment A to APP-GW-GLR-069, "Equipment Survivability Assessment." LAR 18-001 proposes to relocate the list of equipment to new tables in the UFSAR. These tables are based on an updated version of the technical report and are to be added to UFSAR Appendix 19D, "Equipment Survivability Assessment."

ITAAC 2.2.03.09c calls for a thermal lag assessment. This assessment can be performed on the basis of the final design. The license condition requires a thermal lag assessment of the same equipment but is to be based on the as-built configuration. In consolidating these

assessments, the LAR proposes to satisfy the license condition with the thermal lag assessment on the as-designed configuration performed for closure of the ITAAC.

Summary of Information Provided in the Amendment Request

Relocation of hydrogen igniter 30

In this LAR SNC proposed to relocate hydrogen igniter 30 from room 11401 to room 11403 to provide sufficient igniter coverage for the passive residual heat removal inspection flange and reactor coolant system pressurizer spray line hydrogen sources for satisfying the igniter location criteria described in UFSAR Table 6.2.4-6:

- A sufficient number of igniters are placed in the major transport paths (including dominant natural circulation pathways) of hydrogen so that hydrogen can be burned continuously close to the release point. This prevents hydrogen from preferentially accumulating in a certain region of the containment.
- Igniters (minimum of 2) are located in major regions or compartments where hydrogen may be released, through which it may flow, or where it may accumulate.

As described in UFSAR Table 6.2.4-7 and Figures 6.2.4-9 and 6.2.4-13 and COL Appendix C Table 2.3.9-2, hydrogen igniter 32 (tag number VLS-EH-32) is located at elevation 120'-0" in the lower compartment area (room 11400) and is powered from power group 1. Hydrogen igniter 32 is located near the passive residual heat removal inspection flange and pressurizer spray line, which are potential sources of hydrogen release. Hydrogen igniter 32 is the only igniter in the proximity of these two sources. If power group 1 failed, then there would not be any igniter coverage for these sources of hydrogen. This is not consistent with the igniter location criteria described above.

The LAR states that sufficient igniter coverage is already provided to room 11401 by hydrogen igniter 11 powered from power group 2 and hydrogen igniter 13 powered from power group 1. The proposed relocation of hydrogen igniter 30 from room 11401 to room 11403 will provide backup to hydrogen igniter 32 since they are powered by different power groups. It also states that room 11403 and room 11400 are both located in the lower compartment area, and are only separated by two small walls that do not rise to the ceiling and that hydrogen igniters 30 and 32 will provide coverage for both rooms because the room volumes are connected.

In this LAR, SNC proposes the following changes to COL Appendix C:

- Table 2.3.9-2 is revised to change the room number for hydrogen igniter 30 from room 11401 to room 11403.
- Table 2.3.9-2 is revised to change the location for hydrogen igniter 30 from "Loop compartment 01" to "Lower compartment area (CMT [core makeup tank] and valve area)."

In this LAR, SNC proposes the following changes to the UFSAR:

- Table 6.2.4-7 is revised to change the elevation of hydrogen igniter 30 from 120' to 132'-8".

- Figure 6.2.4-9 is revised to depict the relocation of hydrogen igniter 30 from room 11401 to room 11403.
- Figure 6.2.4-13 is revised to add hydrogen igniter 30. The relocation of hydrogen igniter 30 makes it viewable in the figures sectional view.

Relocation and elevation of hydrogen igniters 35, 36, 37, and 38

As described in UFSAR Tables 6.2.4-6 and 6.2.4-7 and Figure 6.2.4-10 and COL Appendix C Table 2.3.9-2, hydrogen igniters 35, 36, 37, and 38 (tag numbers VLS-EH-35/36/37/38) are located at elevation 137'-0" in the in-containment refueling water storage tank (IRWST) (room 11305) vent outlets. As described in UFSAR Table 6.2.4-6, the IRWST can be steam inert or hydrogen rich, inhibiting ignition within the IRWST, including inside the exhaust vent, as hydrogen exhausts from the IRWST.

The licensee proposes relocating hydrogen igniters 35, 36, 37, and 38 from inside the vent outlets of the IRWST (room 11305) to above the outside of the IRWST vent outlets to improve the hydrogen igniters' performance of their design function. The proposed location of the hydrogen igniters is in the upper compartment lower region, room 11500, at an elevation of 137'-6", just outside of the IRWST hooded vents.

Igniter coverage is provided inside the IRWST by hydrogen igniters 9, 10, 15, and 16. Hydrogen igniters 9 and 10 are located near the spargers, which are the potential source of hydrogen within the IRWST. Hydrogen igniters 15 and 16 are located at the inlet vents to the IRWST to prevent hydrogen and oxygen mixtures that could become detonable if air is drawn into the hydrogen-rich IRWST. These four igniters provide sufficient igniter coverage within the IRWST and meet the igniter location criteria in UFSAR Table 6.2.4-6. Hydrogen igniters 35, 36, 37, and 38 are proposed to be located external to the IRWST hooded vents, rather than located within, or "fitted" inside of the IRWST vents.

SNC proposes the following changes to COL Appendix C:

- Table 2.3.9-2 is revised to change the location of hydrogen igniters 35, 36, 37, and 38 from "IRWST" to "IRWST hooded vents."
- Table 2.3.9-2 is revised to change the room number for hydrogen igniters 35, 36, 37, and 38 from 11305 to 11500.

SNC proposes the following changes to the UFSAR:

- Table 6.2.4-6 is revised to change the IRWST description of the hydrogen igniter locations to include: IRWST sparger side, IRWST roof vents, IRWST vacuum breaker vents, and IRWST hooded vents, and to indicate the igniters are ". . . near the vents . . ." rather than ". . . within the vents. . . ." Additionally, for the lower compartment area, the igniters are identified as "near" the mezzanine deck elevation rather than "just above" that elevation.
- Table 6.2.4-7 is revised to move hydrogen igniters 35, 36, 37, and 38 from subcompartment "IRWST Outlets" to the renamed "IRWST Hooded Vents" subcompartment.
- Table 6.2.4-7 is revised to change the elevation of hydrogen igniters 35, 36, 37, and 38 from 137' to 137'-6".

- Figure 6.2.4-10 is revised to move hydrogen igniters 35, 36, 37, and 38 from inside the IRWST vents to above the outside of the IRWST vent outlets.

SNC proposes the following changes to the technical requirements manual (TRM) Table TR 3.6.2-1 (DCD Table 16.3-2, Table 2.8-1):

- A new location is added to Table TR 3.6.2-1 to reflect hydrogen igniters 35, 36, 37, and 38 are now located near the IRWST hooded vents with three igniters required. The new location description for these igniters located just outside the IRWST hooded vents is added to Table TR 3.6.2-1, and the location description of other IRWST related igniters is revised, consistent with changes to Tier 1 Table 2.3.9-2 and UFSAR Tables 6.2.4-6 and 6.2.4-7.

Changes to hydrogen igniter 27 room number and elevation details

COL Appendix C Table 2.3.9-2 states that hydrogen igniter 27 (tag number VLS-EH-27) is located in room 11400. This is inconsistent with UFSAR Figure 6.2.4-5, which shows that hydrogen igniter 27 is located in room 11300.

SNC proposes the following changes COL Appendix C:

- Table 2.3.9-2 is revised to change the room number for hydrogen igniter 27 from room 11400 to room 11300.

SNC proposes the following changes to the UFSAR:

- Table 6.2.4-6 is revised to change the description of the igniter locations in the Lower Compartment Area from "... just above the mezzanine deck elevation or near the ceiling" to "... near the mezzanine deck elevation or near the ceiling."
- Table 6.2.4-7 is revised to change the elevation of hydrogen igniter 27 from 120' to 117'-3".

Changes to hydrogen igniters 9, 10, 15, 16 Location Details

The description of hydrogen igniters associated with the IRWST in UFSAR Table 6.2.4-6 is not sufficiently detailed to afford clear correlation with hydrogen igniters described in UFSAR Table 6.2.4-7, TRM Table TR 3.6.2-1, and COL Appendix C Table 2.3.9-2. Locations are described at differing levels of detail.

The change activity is to make the descriptions of the hydrogen igniters used for coverage for the IRWST clear and consistent among UFSAR Tables 6.2.4-6 and 6.2.4-7, TRM Table TR 3.6.2-1, and COL Appendix C Table 2.3.9-2. Hydrogen igniters 9, 10, 15, and 16 are located inside the IRWST.

SNC proposes the following changes to COL Appendix C:

- Table 2.3.9-2 is revised to change the location description of hydrogen igniters 9 and 10 to add "sparger side" to the location description.
- Table 2.3.9-2 is revised to change the location description of hydrogen igniters 15 and 16 to add "vacuum breaker vents" to the location description.

SNC proposes the following changes to the UFSAR:

- Table 6.2.4-6 is revised to provide more detail for the location of hydrogen igniters providing coverage for the IRWST. The description of the IRWST is divided into four descriptions. The proposed change to the description for hydrogen igniters 9, 10, 15, and 16 adds a description of the IRWST Sparger Side and IRWST Vacuum Breaker Vents. A description identifying the IRWST Roof Vents is added to the sentences in the IRWST location where the function of the IRWST roof vents and the igniters located at the vents are described.
- Table 6.2.4-7 is revised to change to Subcompartment name for hydrogen igniters 9 and 10 from IRWST Interior to IRWST Sparger Side.
- Table 6.2.4-7 is revised to change the Subcompartment name for hydrogen igniters 15 and 16 from IRWST Inlet to IRWST Vacuum Breaker Vents.
- Table 19D-8 "Equipment Located Inside Containment (Time Frames T0 and T1) Equipment, Action Time Frame, and Equipment Location" is added.
- Table 19D-9 "Equipment Located Inside Containment (Time Frames T2 and T3) Equipment, Action Time Frame, and Equipment Location," is added.

SNC proposes the following additional changes

SNC proposes to consolidate COL Appendix C (plant-specific Tier 1 Table 2.2.3-4, ITAAC 2.2.03.09c) with COL Condition 2.D.(12)(g)9. SNC also proposes to relocate the list of equipment to new tables in the UFSAR. These tables are based on an updated version of the technical report. In addition, SNC proposes to revise the COL license Condition 2.D.(12)(g)9 to reference the new tables in the UFSAR.

SNC proposes the following changes to the TRM Table TR 3.6.2-1:

- The row for the IRWST is renamed IRWST Sparger Side and the required number of igniters is changed from 5 to 2, as this row no longer includes the IRWST hydrogen igniters at other locations.
- The row for IRWST Inlet is renamed IRWST Vacuum Breaker Vents.

Staff Evaluation

Relocation of hydrogen igniters 30, 35, 36, 37, and 38

- a) The hydrogen diffusion flame analysis

UFSAR Section 19.41.7 states the following:

Diffusion flames can be postulated to occur at vents or exits from compartments with a hydrogen source that are dead-ended or not well-mixed. Incombustible gas mixtures that include a high concentration of hydrogen may develop in the compartment. When the plume of hydrogen exits the compartment into a room containing oxygen and an ignition source, burning of the plume as a standing flame at the vent may produce locally high temperatures. If the release of hydrogen is sustained, the heat load from the burning may threaten equipment, including the containment shell integrity.

As stated in LAR 18-001, “[t]he diffusion flame assessment conservatively assumes plume ignition as the plume exits the vents/compartment and enters an oxygen-rich volume, which is conservative because the hydrogen concentration is highest at this location and will result in higher thermal loads. As a result, the specific location of igniters does not impact the diffusion flame assessment.” Therefore, the staff concludes that the proposed relocation of hydrogen igniters 30, 35, 36, 37, and 38 does not adversely affect the assumptions or results of the diffusion flame assessment.

b) The hydrogen deflagration analysis

The hydrogen deflagration analysis conservatively assumes the adiabatic, isochoric, complete combustion of hydrogen from 100 percent cladding oxidation to calculate a bounding peak pressure and temperature to show that the containment vessel shell stresses resulting from all deflagration events are within American Society of Mechanical Engineers (ASME) Service Level C limits assuming that hydrogen igniters are not operating. Therefore, the staff concludes that the proposed relocation of hydrogen igniters 30, 35, 36, 37, and 38 will not adversely affect the results of the hydrogen deflagration analysis.

c) The probability of deflagration-to-detonation transition

SNC states that the probability of deflagration-to-detonation transition (DDT) is considered in the containment event tree of the AP1000 probabilistic risk assessment (PRA). It is assumed that the igniters have failed, and therefore, the specific location of the hydrogen igniters does not impact the probability of DDT assumed in the PRA. The staff confirmed from APP-GW-GL-022, Revision 1, “AP1000 Probabilistic Risk Assessment,” Figure 35-1, “Containment Event Tree,” that DDT was not assumed to occur when hydrogen igniters are available. Therefore, the staff concludes that the proposed relocation of hydrogen igniters 30, 35, 36, 37, and 38 will not affect the probability of DDT.

d) IRWST hooded vents location

SNC proposes to add IRWST Hooded Vents location to TRM Table TR 3.6.2-1 with the number of “Required Igniters” listed as “3” (of 4). This maintains availability of at least one igniter in each power group, thus satisfying hydrogen igniter location criteria that allows for the loss of functionality of one hydrogen igniter per location. The staff finds this consistent with UFSAR Table 6.2.4-7 and TRM Table TR 3.6.1 and therefore, acceptable.

e) The equipment survivability assessment

The equipment survivability assessment used the elevations of hydrogen igniters. The licensee states that the hydrogen igniter elevations assumed in the equipment survivability assessment are set to the elevation of the lowest hydrogen igniters in the loop compartments, upper compartments, and CMT compartments in order to maximize the completeness of combustion (thermal effects) for the affected equipment. Therefore, although LAR 18-001 proposed a change of the elevation of hydrogen igniter 30 from 120' to 132' 8", this would not affect the equipment survivability assessment because in the two areas it serves (i.e., Tunnel connecting Loop Compartments and Lower Compartment Area (CMT and Valve area), it is not the lowest hydrogen igniter. SNC states that the locations of hydrogen igniters in the smaller compartments (IRWST, passive core cooling system compartments) are not adjusted in the equipment survivability assessment. Therefore, the licensee’s proposed change of the

elevation of hydrogen igniters 35, 36, 37, and 38 from 137' to 137' 6", is not expected to affect the equipment survivability assessment because the change is within the error limit for elevations of ± 2.5 feet specified in UFSAR Section 6.2.4.2.3, "Hydrogen Ignition Subsystem." As such the staff finds that the licensee's assessment that the proposed relocations of hydrogen igniters 30, 35, 36, 37, and 38 do not adversely affect the assumptions or results of the equipment survivability assessment acceptable.

f) The igniter location criteria

The staff finds that the proposed relocation of hydrogen igniters 30, 35, 36, 37, and 38 meet the igniter location criteria described in UFSAR Table 6.2.4-6, and therefore, acceptable.

g) Effects on safety-related equipment or a fission product barrier

SNC states that hydrogen igniters are part of the containment hydrogen control system (VLS) hydrogen ignition subsystem, which does not interface with or affect safety-related equipment or a fission product barrier. The hydrogen ignition subsystem is provided to address the production of hydrogen following a beyond design basis accident in accordance with 10 CFR 50.44(c). The hydrogen ignition subsystem is a non-Class 1E subsystem and does not interface with any safety-related system; thus, no system or design function or equipment qualification is affected by the proposed changes. The proposed relocations of hydrogen igniters 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 staff finds that the proposed relocation of hydrogen igniters 30, 35, 36, 37, and 38 would not affect any safety-related equipment or a fission product barrier, and therefore, acceptable.

Changes to hydrogen igniter 27 room number and elevation details

SNC proposes to revise UFSAR Table 6.2.4-7 to change the elevation of hydrogen igniter 27 from 120' to 117'-3". The staff finds that the new elevation differs only 7 inches from that provided in UFSAR Figure 6.2.4-5, "Hydrogen Igniter Locations – Section View." However, the staff finds the difference in elevations from UFSAR Figure 6.2.4-5 is within the error limit for elevations of ± 2.5 feet specified in UFSAR Section 6.2.4.2.3, and therefore acceptable.

The staff review finds that licensee's proposed changes to the room number, location description, and elevation of hydrogen igniter 27 do not adversely affect the design functions of the VLS hydrogen ignition subsystem or the analyses and assessments or the analysis and assessment methods, and therefore, is acceptable.

Changes to hydrogen igniters 9, 10, 15, 16 location details

The staff review finds that licensee's proposed change to hydrogen igniters 9, 10, 15, and 16 location description does not adversely affect the design functions of the VLS hydrogen ignition subsystem or the analyses and assessments or the analysis and assessment methods, and is therefore, acceptable.

Revised list of equipment subject to thermal lag assessment

The staff review finds that the licensee's revised list of equipment appropriately addresses the open items that were associated with the original equipment survivability assessment. These open items motivated the imposition of license condition 2.D.(12)(g)9.

The staff finds that moving the list from the license condition to the UFSAR is an acceptable way to ensure that the thermal lag assessment performed on the basis of the approved design will remain valid under as-built conditions. This is because approved change control processes will assure that if the equipment location is different from the as-designed location, the adequacy of the thermal lag assessment will be confirmed or a new assessment will be performed. For these reasons, the revision and the relocation are acceptable.

Consolidation of ITAAC 2.2.03.09c and License Condition 2.D.(12)(g)9

The staff review finds that the SNC's proposal to consolidate ITAAC 2.2.03.09c with License Condition 2.D.(12)(g)9 assures both that the ITAAC is met and adequate measures are in place to confirm that the thermal lag assessment of the equipment remains valid.

When construction is complete, the as-built condition is confirmed to conform to the design, satisfying the license condition. If it does not, the thermal lag assessment will be evaluated (for the non-conforming component). In other words, the assessment that has been performed will be confirmed to be applicable or it will be revised. The revised calculation must show that the equipment will perform as intended or additional modification will be required to satisfy the license condition.

SNC plans to satisfy the ITAAC by analysis based on the as-designed configuration. The validity of the thermal lag assessment of the as-built condition will be confirmed or established by a revised analysis. Therefore the proposed consolidation of the ITAAC and the license condition is acceptable to the staff.

Conclusion

The staff review finds that the licensee's proposed changes to COL Appendix C, UFSAR, and TRM meet requirements of 10 CFR 50.44(c) and GDC 41, 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 relates to changes to the equipment survivability assessment requirements associated with hydrogen burns during beyond design basis accidents as described in the licensing basis documents,

including COL Condition 2.D(12)(g)9 and plant-specific Tier 1 Sections 2.2.3 and 2.3.9. The result of this exemption would be that SNC could implement the requested modifications to Tier 1 information, with corresponding changes to COL Appendix C. 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 18-001. 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)(ii). 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 Tier 1, Subsection 2.2.3 and Table 2.2.3-4 and to Tier 1, Subsection 2.3.9 and Table 2.3.9-2 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 NRC 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 a change in the equipment survivability requirements associated with hydrogen burns during beyond design basis accidents as described in the licensing basis documents, and as presented in plant-specific Tier 1 information, 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 52.7 and 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 the 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 structures, systems, and components to perform their functions or negatively impact safety.

Special circumstances are present in the particular circumstances discussed in LAR 18-001 because the application of the specified Tier 1 information is not necessary to achieve the underlying purpose of the rule. The proposed exemption would provide revisions and clarifications related to assessments of equipment survivability during beyond design basis events. This exemption requests revisions to Tier 1, Subsection 2.2.3 and Table 2.2.3-4 and to Tier 1, Subsection 2.3.9 and Table 2.3.9-2 that continue to demonstrate that the applicable regulatory requirements will be met. Therefore, for the above reasons, the staff finds that the special circumstances required by 10 CFR 52.7 and 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. The justification provided in LAR 18-001, 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 hydrogen control system. 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 proposed changes will not adversely affect the ability of the hydrogen control system 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 in 10 CFR 50.91(b)(2), on June 25, 2018, the Georgia State official was notified regarding the amendment. 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 (*Federal Register*, 83 FR 23728, dated May 22, 2018). 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 the licensee's facility. Therefore, the staff grants the licensee 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. Request for License Amendment and Exemption RE: Equipment Survivability Assessment (LAR 18-001) letter from Southern Nuclear Operating Company, dated April 6, 2018 (ADAMS Accession No. ML18096B463).
2. Vogtle Electric Generating Plant, Units 3 and 4 Updated Final Safety Analysis Report, Revision 6 and Tier 1, Revision 5, dated June 15, 2017 (ADAMS Accession No. ML17172A218).
3. AP1000 Design Control Document, Revision 19, dated June 13, 2011 (ADAMS Accession No. ML11171A500).
4. Combined License NPF-91 for Vogtle Electric Generating Plant Unit 3, Southern Nuclear Operating Company (ADAMS Accession No. ML14100A106).
5. Combined License NPF-92 for Vogtle Electric Generating Plant Unit 4, Southern Nuclear Operating Company (ADAMS Accession No. ML14100A135).
6. AP1000 DCD, APP-GW-GL-022, Revision 1, "AP1000 Probabilistic Risk Assessment"
7. AP1000 DCD, APP-GW-VP-025, "AP1000 Equipment Survivability Assessment"