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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 186 AND 184

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 June 19, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20171A563), as supplemented by letter dated September 18, 2020 (ADAMS Accession No. ML20262H206), 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. SNC License Amendment Request (LAR) 20-005 requested changes to COL Appendix A, Technical Specification (TS) 3.6.3, "Containment Isolation Valves," and TS 3.6.9, "Vacuum Relief Valves," to exclude the vacuum relief containment isolation valves from TS Limiting Condition for Operation (LCO) 3.6.3 and address the containment isolation function, operability, actions, and surveillances in TS 3.6.9.

The supplement dated September 18, 2020, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the NRC staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on August 11, 2020 (85 FR 48572).

2.0 REGULATORY EVALUATION

2.1 Description of Proposed Changes

The requested amendment proposes changes to TS 3.6.3 to exclude the containment system vacuum relief valves from TS LCO 3.6.3 and address their operability, for both containment isolation and containment vacuum relief, in TS 3.6.9.

In TS LCO 3.6.9, SNC requests changing operability of two vacuum relief "flow paths" to requiring operability of two vacuum relief check valves and two vacuum relief isolation valves. LAR 20-005 proposes: new Actions, to address inoperability for the containment isolation closing function for both the vacuum relief check valves and vacuum relief isolation valves; new Surveillance Requirement (SR) 3.6.9.2, to add a verification that each vacuum relief isolation valve is closed except when performing its vacuum relief function or when open for Surveillances; changing SR 3.6.9.2 (renumbered as SR 3.6.9.3) "flow path" to "check valve and each vacuum relief isolation valve"; and revising SR 3.6.9.3 (renumbered as SR 3.6.9.4), to verify the vacuum relief isolation valves actuate to both open and closed positions.

2.2 Regulatory Requirements and Guidance

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

Title 10 of the *Code of Federal Regulations* (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,[1] or the TS, or requires a license amendment under paragraphs B.5.b or B.5.c of the section.

10 CFR Part 52, Appendix D, Section VIII.C.6 states that after issuance of a license, "Changes to the plant-specific TS will be treated as license amendments under 10 CFR 50.90." 10 CFR 50.90 states that a license holder, including a holder of a COL, must file an application for an amendment with the Commission that fully describes the changes desired. The proposed LAR requires changes in the TS, and therefore an LAR is required to be submitted for NRC approval.

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 changes to TS (COL Appendix A). Therefore, NRC approval is required prior to making the plant specific proposed changes in this LAR.

10 CFR 50.36 specifies requirements for TS that impose limits, operating conditions, and other requirements upon reactor facility operation for the public health and safety. The TS are derived from the analyses and evaluations in the safety analysis report. In general, TS must contain: (1) safety limits, limiting safety system settings, and limiting control settings; (2) limiting conditions for operation; (3) surveillance requirements; (4) design features; and (5) administrative controls. 10 CFR 50.36(c)(2)(i) states "Limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of

[1] For VEGP Units 3 and 4, the licensee is partially exempt from the requirement in Section VIII.B.5.a regarding prior NRC approval of departures from Tier 2* information, as established by Section 2.D.(13) of the COL.

the facility." 10 CFR 50.36(c)(3) states "Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met."

The specific NRC technical requirements applicable to LAR 20-005 are the general design criteria (GDC) 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 16, "Containment design," states "Reactor containment and associated systems shall be provided to establish an essentially leak-tight barrier against the uncontrolled release of radioactivity to the environment and to assure that the containment design conditions important to safety are not exceeded for as long as postulated accident conditions require."

GDC 56, "Primary containment isolation," requires "[e]ach line that connects directly to the containment atmosphere and penetrates primary reactor containment shall be provided with containment isolation valves as follows, unless it can be demonstrated that the containment isolation provisions for a specific class of lines, such as instrument lines, are acceptable on some other defined basis:

(1) One locked closed isolation valve inside and one locked closed isolation valve outside containment; or
(2) One automatic isolation valve inside and one locked closed isolation valve outside containment; or
(3) One locked closed isolation valve inside and one automatic isolation valve outside containment. A simple check valve may not be used as the automatic isolation valve outside containment; or
(4) One automatic isolation valve inside and one automatic isolation valve outside containment. A simple check valve may not be used as the automatic isolation valve outside containment.

Isolation valves outside containment shall be located as close to the containment as practical and upon loss of actuating power, automatic isolation valves shall be designed to take the position that provides greater safety."

Guidance for staff review of containment isolation is contained in NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Section 6.2.4, "Containment Isolation System."

Guidance for staff review of TSs is contained in NUREG-0800, Section 16.0, "Technical Specifications." The NRC staff has prepared standard technical specifications (STS) for each of the light–water reactor nuclear steam supply systems and associated balance of plant equipment systems. The guidance specifies that the staff review whether content and format of proposed TS are consistent with the applicable STS. Where TS provisions depart from the reference TSs, the staff determines whether proposed differences are justified by uniqueness in plant design or other considerations. The applicable current STS for VEGP Units 3 and 4 are contained in NUREG-2194, "Standard Technical Specifications, Westinghouse Advanced Passive 1000 (AP1000) Plants," Revision 0.

3.0 TECHNICAL EVALUATION

The NRC staff evaluated SNC's proposed change to determine whether the proposed TS changes are consistent with the regulatory requirements discussed in Section 2.0 of this safety evaluation and licensing and design basis information.

3.1 Evaluation of the Facility Design

The containment vacuum relief system consists of two check valves, in parallel, inside containment, a common containment penetration shared with the containment air filtration system, and two containment isolation valves, mounted in parallel, outside containment. The vacuum relief valves close air flow from containment to the atmosphere. The vacuum relief containment isolation valves are normally closed motor-operated isolation valves, located outside the containment. These valves open automatically to provide a flow path to allow atmospheric air into the containment to equalize a negative differential pressure across the containment vessel shell. These valves also perform a containment isolation function when vacuum relief is not required. An interlock ensures the availability of the engineered safety features for the vacuum relief isolation valves to perform their vacuum relief and containment isolation functions. However, the protection and safety monitoring system (PMS) control logic gives priority to opening the vacuum relief valves on negative pressure over closing them for the containment isolation function.

VEGP Units 3 and 4 TS 3.6.3, "Containment Isolation Valves," requires each containment isolation valve shall be operable in Modes 1, 2, 3, and 4, (as defined in TS Table 1.1-1, "Modes"). When "[o]ne or more penetration flow paths with one containment isolation valve inoperable," the required action in part, is to "[i]solate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured" within 4 hours.

TS 3.6.9, "Vacuum Relief Valves," requires, in part, "[t]wo vacuum relief flow paths shall be operable…" when in Modes 1, 2, 3, and 4. If one vacuum relief flow path is inoperable, the required action is to restore vacuum relief flow path to operable status within 72 hours. If unable to restore one vacuum relief flow path to operable status the plant is required to be in Mode 3 in 6 hours and Mode 5 in 36 hours.

SNC stated in its submittal for LAR 20-005, as supplemented:

> In the event that three or more Containment Radioactivity High detectors are inoperable or the Required Actions to bypass and/or trip one or two (respectively) inoperable channels are not performed within the Completion Time, the specified action in TS LCO 3.3.8 is to declare the affected isolation valve(s) inoperable. This action would result in entry into TS 3.6.3 for inoperable containment isolation valve(s), requiring actions to isolate the affected penetration flow path. With the vacuum relief flow paths isolated, the operators would also be required to enter into the TS 3.6.9 for inoperable vacuum relief valves, since the isolated flow path would render them inoperable. In TS 3.6.9, the required action would be to shutdown to MODE 5 and open a containment air flow path ≥ 6 inches in diameter. The Actions of LCO 3.6.3 to close and deactivate valve(s) in the penetration in the event of inoperable vacuum relief valve(s) do not account for the priority safety function for the valves to open for vacuum relief.

> [Therefore]… TS 3.6.3 is changed to exclude the containment system vacuum relief valves from TS LCO 3.6.3 and address their operability, for both containment isolation and containment vacuum relief, in TS 3.6.9.
> TS 3.6.9 is changed to address the two operability functions of the vacuum relief valves: operability for opening to provide containment vacuum relief, and operability for closing to provide containment isolation. In TS LCO 3.6.9, operability of two vacuum relief "flow paths" is changed to requiring operability of two vacuum relief check valves and two vacuum relief isolation valves. New Actions are provided to address inoperability for the containment isolation closing function for both the vacuum relief check valves and vacuum relief isolation valves. New [SR] 3.6.9.2 adds a verification that each vacuum relief isolation valve is closed except when performing its vacuum relief function or when open for Surveillances. SR 3.6.9.2 (renumbered as SR 3.6.9.3) "flow path" is changed to "check valve and each vacuum relief isolation valve."[2] SR 3.6.9.3 (renumbered SR 3.6.9.4) is revised to verify the vacuum relief isolation valves are verified to actuate to both open and closed positions.

The NRC staff reviewed the proposed TS changes with respect to the requirements of 10 CFR 50.36, GDC 16, and GDC 56. The staff also used the guidance in NUREG-0800, Sections 6.2.4 and 16.0.

The staff finds that changing TS 3.6.3 to exclude the containment system vacuum relief valves from TS LCO 3.6.3 and address their operability, for both containment isolation and containment vacuum relief, in TS 3.6.9 does not make any physical changes to the facility design or design basis. The change does not change the LCO for any other containment isolation valves other than those in the containment vacuum relief flow path. The proposed change does not impact the PMS logic design associated with the containment system vacuum relief valves. Therefore, because there are no changes to the containment design or design basis, the staff finds that the 10 CFR 50.36(c)(2)(i) and 10 CFR 50.36(c)(3) criteria continue to be met, and GDC 16 and GDC 56 remain satisfied. The staff's review of changes to TS 3.6.3 and TS 3.6.9 is addressed in Section 3.2 of this evaluation. The staff's review of the LAR's use of risk information and analyses to support the TS change is addressed in Section 3.2.2.2 of this safety evaluation.

3.2 Evaluation of TS 3.6.3 and TS 3.6.9 Changes

This section of the safety evaluation pertains to the changes in format and content of TS 3.6.3 and TS 3.6.9.

3.2.1 *TS 3.6.3*

LCO 3.6.3 wording is revised from "…except for the containment isolation valves associated with closed systems" to "…except for containment isolation valves associated with closed systems and for vacuum relief valves."

The staff finds this proposed change is consistent with the current approved TS format and content for exceptions to LCO 3.6.3. The staff finds the change acceptable because the LCO markup clearly addresses the proposed change to include an additional exception related to the

[2] Proposed change to SR 3.6.9.2 (renumbered as SR 3.6.9.3) was updated in supplement dated September 18, 2020.

containment isolation function associated with vacuum relief valves, the proposed change is consistent with the current approved LCO 3.6.3 format and content, and there are no adverse impacts to safety as a result of the change.

3.2.2 *TS 3.6.9*

There are several proposed changes to TS 3.6.9, in order to accommodate the relocation of the containment isolation valve requirements (i.e., the close function) associated with vacuum relief valves from TS 3.6.3 to TS 3.6.9. The proposed TS 3.6.9 includes changes to the LCO, Applicability, Actions (i.e., Notes, Conditions, Required Actions and Completion Times), and Surveillance Requirements.

In the LAR, as supplemented, SNC explains that the vacuum relief valves are configured as two check valves located in independent parallel paths on the inside of containment and two motor-operated valves located in independent parallel paths on the outside of containment. The two check valves and the two motor-operated valves (also referred to herein as the vacuum relief isolation valves) are connected by a common containment penetration. SNC determined that use of "flow path" in the current LCO 3.6.9 can be "ambiguous" due to the vacuum relief design (parallel paths both inside and outside containment) and that LCO 3.6.9 should be clarified to address the dual safety functions (containment isolation and containment vacuum relief) that these valves are required to meet. As such, SNC proposed changes to LCO 3.6.9 from "Two vacuum relief flow paths shall be OPERABLE" to "Two vacuum relief check valves and two vacuum relief isolation valves shall be OPERABLE." In addition, SNC proposed adding a Note to TS 3.6.9, Applicability, to identify that the containment isolation function (operability for closing) is only required in Modes 1 through 4. Furthermore, SNC proposed a new Note to Actions heading to state that if vacuum relief valve leakage from containment results in exceeding the overall containment leakage rate acceptance criteria, then the applicable Conditions and Required Action of LCO 3.6.1 must be entered.

The staff reviewed SNC proposed changes in the areas summarized above. The staff finds the proposed changes acceptable because the changes: a) remove ambiguity by specifying that two check valves and two isolation valves are required to be operable; b) add a Note to TS 3.6.9, Applicability, to account for the containment isolation function (closing) of vacuum relief valve operability, consistent with TS 3.6.3 requirements; and c) add a Note to TS 3.6.9, Actions, regarding valve leakage, also consistent with a TS 3.6.3 requirement.

In the LAR, as supplemented, SNC describes several changes to the Actions table (Conditions, Required Actions, and Completion Times) that were necessary in order to add the containment isolation function (closing) for vacuum relief valve operability into the existing TS 3.6.9, which currently only addresses the containment vacuum relief function (opening) of vacuum relief valve operability. The focus of the next several subsections is on the staff review of changes to the Actions table.

3.2.2.1 *Actions A and B*

As described in the LAR, as supplemented, TS 3.6.9, Condition A, is changed from "One vacuum relief flow path inoperable" to "One vacuum relief check valve inoperable for opening," and the Required Action is changed from an action for restoring the "flow path to OPERABLE status" to an action for restoring the "check valve to OPERABLE for opening status." The revised Action addresses the clarification of replacing "flow paths" with specific requirements on

valves. The revised Action also provides the clarification of opening function versus closing function.

As described in the LAR, as supplemented, a new Condition B is then proposed to address the inoperability for opening of one vacuum relief isolation valve. This new Condition B states "One vacuum relief isolation valve inoperable for opening" with the Required Action to restore the valve to operable within 72 hours. These modifications to TS 3.6.9, Action A, and the addition of Action B perform the same function to maintain vacuum relief operability as the current TS 3.6.9, Condition A, for the vacuum relief flow path, but are more specific to the valve configuration and the operability of these valves to open to provide vacuum relief. The Completion Time of 72 hours to restore the vacuum relief flow path remains the same as the current LCO 3.6.9, Action A. Allowing one check valve (Condition A) and one isolation valve (Condition B) to be inoperable concurrently provides for one 100% capable flow path through the remaining check valve and isolation valve.

The staff reviewed SNC's proposed changes in the areas summarized above. The staff finds these changes to be acceptable because they are consistent with the proposed TS LCO 3.6.9 (assessed previously) by removing ambiguity and creating the ability to distinguish between the valves dual safety functions: opening for containment vacuum relief, which is addressed in revised Action A and new Action B, and closing for containment isolation, which is addressed by adding new Actions C and D discussed below.

3.2.2.2 *Actions C and D*

As described in the LAR, as supplemented, the containment isolation function for the vacuum relief valves, is addressed in proposed TS 3.6.9, Actions C and D. For the new Condition C, with one or more vacuum relief check valves inoperable for closing, or one or more vacuum relief isolation valves inoperable for closing (including either two vacuum relief check valves inoperable for closing or two vacuum relief isolation valves inoperable for closing), provided new proposed Condition D is not entered, the penetration has not lost isolation capability; only single failure protection is lost. The new Required Action C.1 is to restore the affected valve(s) to OPERABLE for closing status within 7 days, which will restore the single failure protection for the containment isolation function. As described in the LAR, the Completion Time to restore the valve(s) to OPERABLE for closing status in 7 days is reasonable relative to the importance of supporting containment isolation capability during Modes 1, 2, 3, and 4, while retaining the capability for vacuum relief.

As described in the LAR, as supplemented, for the new TS 3.6.9, Condition D, with one or more vacuum relief isolation valves inoperable for closing and one or more vacuum relief check valves inoperable for closing, the new Required Action D.1 is to restore either both vacuum relief isolation valves to OPERABLE for closing status, or to restore both vacuum relief check valves to OPERABLE for closing status, in order to establish a containment isolation barrier. For Action D, the Completion Time of 1 hour to restore the valves to OPERABLE for closing is the same as TS 3.6.3 Action B in which there is no isolation barrier available in the penetration flow path.

The staff reviewed SNC's proposed changes in the two areas (new Action C and new Action D) summarized above. The staff finds the changes acceptable because a) they are consistent with the proposed LCO 3.6.9 (assessed previously) by removing ambiguity and creating the ability to distinguish between the valve's dual safety functions; and b) they are consistent with TS 3.6.3 provisions in which there is no operable isolation barrier. The staff review of a 7 day Completion

Time for Required Action C.1 was assessed for defense-in-depth and safety margin, and risk insights below. Based on the assessment in these sections of the safety evaluation, the staff finds the permanent change to a 7 day Completion Time acceptable.

Defense-in-Depth and Safety Margin

In Enclosure 4 to its letter dated September 18, 2020, SNC stated that there is no change to the safety functions due to the proposed TS changes. Although either the vacuum relief isolation valves or vacuum relief check valves will be out of service longer than the current TS allows, the NRC staff finds that the capability to fulfill the containment isolation function of the containment air filtration system (VFS) will be retained when the unaffected valves function as designed. The decrease in redundancy of the VFS to perform its containment isolation function is addressed by existing operational programs and procedures, as discussed in the risk insights section below. Based on its review, the NRC staff finds that the defense-in-depth is preserved commensurate with the expected frequency and consequence of challenges from the proposed change.

SNC further stated, in Enclosure 4 to its letter dated September 18, 2020, that the safety analysis acceptance criteria stated in the Updated Final Safety Analysis Report Subsection 6.2.1.1.4, “External Pressure Analysis,” for the vacuum relief function and Chapter 15, “Accident Analyses,” for the containment isolation function are not impacted by this change. The NRC staff determined that the proposed change will not allow plant operation in a configuration outside the design basis, the requirements regarding the VFS credited in the accident analysis will remain the same, the design and operation of the VFS is not modified by this LAR, and no codes or standards approved for use by the NRC relevant to the VFS and associated systems are modified or affected. Based on its review, the NRC staff finds that safety margins continue to be maintained during the proposed completion time.

Risk Insights

In Enclosure 1 to the LAR, SNC stated that the proposed increase to the TS completion time for TS 3.6.9, Condition C, is to reduce the risk of a TS required shutdown upon discovery of an inoperable vacuum relief valve containment isolation function. The existing TS required the licensee to secure the containment isolation valve closed to restore redundancy in containment isolation; subsequently, the plant would incur a loss of function for vacuum relief and enter into a TS required shutdown. In Section 3 of Enclosure 1 to the LAR, SNC supported its proposed change based on the risk impact of the proposed change. SNC stated that insights from the at-power internal events probabilistic risk assessment (PRA), internal flooding, seismic, and internal fire hazards were considered. SNC estimated the risk impact based on insights from its PRA, including quantitative results. Although SNC submitted quantitative PRA results to support the proposed change, the submittal did not formally follow the guidance in Regulatory Guide 1.177, Revision 1, “An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications” (ADAMS Accession No. ML100910008). Therefore, the NRC staff did not rely on the quantitative risk information provided by SNC in Enclosure 1 to the LAR for its decision making. Further, the NRC staff did not review SNC’s PRA models to determine their technical acceptability to support this LAR.

The proposed change to the completion time for TS 3.6.9, Condition C, one or more vacuum relief check valves inoperable for closing or one or more vacuum relief isolation valves inoperable for closing, increases the completion time from 4 hours to 7 days. With one or more check valves inoperable for closing, the isolation valves alone are relied upon to perform the

required function to isolate containment. With one or more isolation valves inoperable for closing, the check valves alone are relied upon to perform the required function to isolate containment. SNC stated that the completion time to restore the valve(s) to OPERABLE for closing status in 7 days is reasonable relative to the importance of supporting containment isolation capability during Modes 1, 2, 3, and 4, while retaining the capability for vacuum relief. SNC further stated that during this 7-day period, with the containment isolation function remaining, the credited accident mitigation sequence and assumed accident radiological releases from containment are not impacted.

In Enclosure 4 to its letter dated September 18, 2020, SNC provided additional risk insights to support the proposed change. The NRC staff considered SNC-provided risk insights in its evaluation of the proposed changes to the completion time for Action C.1 in TS 3.6.9. In addition to reviewing SNC-provided risk insights, the NRC staff reviewed the NRC's Standardized Plant Analysis Risk (SPAR) model for AP1000 and considered insights from past precedence on risk-informed evaluation of extensions to containment valve isolation completion times as described in WCAP-15791-NP-A, Revision 2, "Risk-Informed Evaluation of Extensions to Containment Isolation Valve Completion Times," (ADAMS Accession No. ML082120239). The NRC staff used these sources to focus its scope of review and support its regulatory finding for the proposed completion time in Action C.1.

In its letter dated September 18, 2020, SNC provided information on the dominant risk sequences resulting from the proposed change for at-power internal events, internal floods, internal fires, and seismic hazards. For at-power internal events, SNC stated that the dominant risk scenarios resulting from the proposed change that impact accident prevention involved loss of offsite power and general transient initiators. The scenarios included failure of long-term startup feedwater operation and loss of long-term containment cooling. SNC did not identify any additional insights from internal fire, internal flood, or seismic hazards.

In its letter dated September 18, 2020, SNC stated that the dominant risk sequences that impact accident mitigation are general transients and loss-of-coolant accident (LOCA) events coupled with independent failure of the unaffected redundant vacuum relief isolation valves. SNC also provided the dominant risk sequences for accident mitigation from internal fire, internal flood, and seismic hazards.

For the dominant risk scenarios identified, SNC described how existing operational programs are structured to manage risk. SNC stated that the vacuum relief isolation valves and vacuum relief check valves are monitored within the scope of the maintenance rule program. SNC stated that for an inoperable-for-closing vacuum relief valve, its existing programs are able to manage the risk by: suspending ongoing work on the vacuum relief valves, rescheduling pending work on any component associated with the containment vacuum relief penetration, initiating restoration of out-of-service equipment associated with the vacuum relief penetration, and maintaining the unaffected vacuum relief valves closed.

SNC stated that the operator time window for containment isolation for a bounding small LOCA with successful reactor trip from the start of the initiator until core damage is 21 minutes. SNC further stated that containment isolation status monitoring is contained within the Emergency Operating Procedures network, and containment isolation status is visually represented on the Critical Safety Function Status Trees in the main control room as well as visually and audibly via the Alarm Presentation System. If proper isolation does not occur, then manual containment isolation is first performed from the main control room and then by local actions, if unsuccessful. SNC stated that for long-term containment cooling events, the operator has longer time

windows to recover, and core damage was not anticipated during the first 24 hours following such an event. SNC further explained that containment isolation monitoring is contained within the Emergency Operating Procedure network, and cues to the operators to recover containment isolation failure are received early in the scenario. If proper actuation does not occur on a safeguards actuation signal, manual containment isolation would be performed from the main control room, and followed by local actions, if necessary, to isolate the containment. SNC also discussed the impact of the sources of uncertainty on the risk insights for the proposed change.

In its letter dated September 18, 2020, SNC addressed the basis for screening out other external hazards and low power and shutdown (LPSD). SNC explained that the at-power non-seismic external hazards were screened out based on their lack of impact on the risk insights for the proposed change. For LPSD, SNC stated that Modes 2 and 3 can be adequately represented by the at-power model and more time would be available for operator actions in those modes compared to at-power. SNC stated that there were no unique risk insights from the proposed change for operation in Mode 4 and that insights from the at-power PRA were conservative for Mode 4 with respect to the containment isolation function because the time to core damage and time to pressurize containment are longer when compared to at-power core damage scenarios. SNC provided a list of the safety-related decay heat removal systems for Mode 4 with normal residual heat removal system (RNS) in service. SNC also provided a list of operational programs that would ensure that RNS remains operable and that reactor coolant system cooling could be established in the event that RNS is lost during Mode 4.

The NRC staff reviewed SNC's risk insights, maintenance procedures, and existing programs related to the proposed change. In its review, the NRC staff considered that the baseline risk for the AP1000 design is on the order of 2E-07. In addition, the NRC staff's review also considered WCAP-15791-NP-A, Revision 2. Although SNC did not reference WCAP-15791-NP-A, Revision 2, the NRC staff determined that the WCAP-15791-NP-A approach was reasonable to estimate the order of magnitude of risk from the proposed change. The NRC staff's estimate provided support that 7-day completion time for one or more vacuum relief check valves or one or more vacuum relief isolation valves INOPERABLE does not result in a substantial increase in risk compared to acceptance guidelines used by the NRC for risk-informed applications. In its estimation, the NRC staff used conservative baseline risk and failure probabilities. This confirmation also demonstrated that the proposed change is consistent with past precedence for similar changes.

Additionally, the NRC staff used the AP1000 SPAR model to assess the proposed change. The NRC staff focused on confirming the dominant risk contributors identified by SNC. This confirmation increases confidence in the appropriateness of SNC-provided risk insights for the proposed change.

The NRC staff reviewed SNC's basis for screening out the at-power non-seismic external events and determined that the screening of these events is acceptable because these hazards do not contribute unique risk insights for the proposed change. In the NRC staff's review of the LPSD, the NRC staff considered SNC-provided insights and confirmed via use of the AP1000 LPSD SPAR model that the proposed change does not result in a substantial increase in risk compared to the acceptance guidelines used by the NRC for risk-informed applications. Therefore, the NRC staff determined that it is acceptable to screen LPSD from the impact of containment vacuum relief valves being maintained open for a 7-day period.

The NRC staff's review of SNC's risk insights finds that SNC appropriately identified the dominant risk scenarios for the proposed change and that SNC has appropriate maintenance

and operational programs in place to manage the risk from the dominant risk scenarios. Therefore, the NRC staff concludes that risk insights support the proposed change for Action C.1 in TS 3.6.9.

3.2.2.3 *Actions E and F*

As described in the LAR, as supplemented, with the addition of the new Actions in TS 3.6.9, the current Condition B and associated Required Actions have an editorial update from “B” to “E.” The current Condition C and associated Required Actions have an editorial update from “C” to “F”. In addition, renumbered Condition F is now applicable if the Required Action and associated Completion Times for Conditions A, B, C, D, or E are not met, which covers the new Conditions added to address both the containment vacuum relief function and the containment isolation function of the valves while operating in Mode 1, 2, 3, or 4. The corresponding Required Actions remain the same as the current TS 3.6.9 in the event that the vacuum relief capability or the containment temperature differential cannot be restored within the required Completion Time, and now also addresses if the containment isolation close function cannot be restored within the required Completion Time. Condition F also includes new Conditions to address two vacuum relief check valves inoperable for opening, or two vacuum relief isolation valves inoperable for opening, in Mode 1, 2, 3, or 4 which corresponds to the change in LCO 3.6.9 from “flow paths” to “check valves and vacuum relief isolation valves.” The corresponding Required Actions remain the same as the current TS 3.6.9 in the event that the vacuum relief capability is not available due to the loss of all available flow paths.

The staff reviewed SNC’s proposed changes in the areas summarized above. The staff finds the changes acceptable because: a) they are consistent with the proposed LCO 3.6.9 (assessed previously) by removing ambiguity and creating the ability to distinguish between the valve’s dual safety functions, and b) the Condition F Required Actions and Completion Time remain the same as the current TS 3.6.9 in the event that the vacuum relief capability is not available due to the loss of all available flow paths.

3.2.2.4 *Actions G*

As described in the LAR, as supplemented, the current Condition D and associated Required Actions are changed from “D” to “G”. For renumbered Condition G, the requirements being relocated from LCO 3.6.3 are not required in Mode 5 or 6, so this condition is only applicable if Condition A, B, or E and the associated actions to restore vacuum relief capability cannot be performed within the required Completion Time, or the containment inside to outside temperature differential cannot be restored within the required completion time, or if two vacuum relief check valves are inoperable for opening, or if two vacuum relief isolation valves are inoperable for opening. The current Condition of "Both vacuum relief flow paths inoperable" is more specifically identified as either two vacuum relief check valves inoperable for opening or two vacuum relief isolation valves inoperable for opening, as these reflect the two possible conditions where all relief capability is inoperable. The Required Actions and Completion Times remain the same as the current TS 3.6.9 for loss of all vacuum relief flow paths or loss of the allowable containment temperature differential during Modes 5 and 6.

The staff reviewed SNC’s proposed changes in the areas summarized above. The staff finds the changes acceptable because: a) the changes are consistent with the proposed LCO 3.6.9 (assessed previously) by removing ambiguity and creating the ability to distinguish between the valve’s dual safety functions and b) the Condition G Required Actions and Completion Time

remain the same as the current TS 3.6.9 for loss of all vacuum relief flow paths or loss of the allowable containment temperature differential during Modes 5 and 6.

3.2.2.5 *SR 3.6.9.2*

As described in the LAR, as supplemented, a new SR 3.6.9.2 is added to include verification that each vacuum relief isolation valve is closed every 31 days, with exceptions for when the valves are open for other surveillances or if they are performing a vacuum relief function. Meeting one of these Noted exceptions provides an allowance for vacuum relief valves to be open and not considered inoperable. This SR ensures that the vacuum relief isolation valves are closed as required, or if open, the valves are open for an allowable reason. The vacuum relief isolation valves are normally closed. SNC stated that the frequency of 31 days is appropriate considering the valves should only be opened to relieve vacuum or manually opened to perform surveillances and the probability of the valve misalignment is low. Therefore, SNC concluded that verification every 31 days is appropriate considering the probability of the valve misalignment is low.

The staff reviewed SNC's proposed changes in the area summarized above. The staff finds the change acceptable because this SR ensures that the vacuum relief isolation valves are closed as required, or if open, the valves are open for an allowable reason and the verification every 31 days is appropriate considering the probability of the valve misalignment is low.

3.2.2.6 *SR 3.6.9.3*

As described in the LAR, as supplemented, the current SR 3.6.9.2 has an editorial renumbering update to SR 3.6.9.3 and a clarification from verify each vacuum relief "flow path" to verify each vacuum relief "check valve and each vacuum relief isolation valve." Each vacuum relief check valve and vacuum relief isolation valve is to be verified OPERABLE, which includes both operable for opening and operable for closing, in accordance with the Inservice Testing Program.

The staff reviewed SNC's proposed changes in the area summarized above. The staff finds the change acceptable because this SR provides assurance that the limiting conditions for operation will be met for the dual function vacuum relief check valves and vacuum relief isolation valves.

3.2.2.7 *SR 3.6.9.4*

As described in the LAR, as supplemented, the current SR 3.6.9.3 has an editorial renumbering update to SR 3.6.9.4 and is modified to address both the automatic opening and closing of the vacuum relief isolation valve. SR 3.6.9.4 is to verify each vacuum relief isolation valve actuates on an actual or simulated signal every 24 months. For vacuum relief, these valves must demonstrate the capability to open by an actuation signal. For containment isolation, these valves must demonstrate the capability to close by an actuation signal. The surveillance frequency of 24 months is the same as the current TS 3.6.9 for verification of the actuation to relieve vacuum on an actual or simulated signal (which only applies to the vacuum relief isolation valve) and the same as SR 3.6.3.5 for automatic containment isolation valves.

The staff reviewed SNC's proposed changes in the area summarized above. The staff finds the change acceptable because this SR addresses both the automatic opening and closing of the

vacuum relief isolation valve and uses the same surveillance frequency for automatic containment isolation valves and the current SR 3.6.9.3 frequency.

Conclusion Regarding Changes to TS 3.6.3 and TS 3.6.9

From the above evaluation in Section 3.1, the NRC staff finds that the proposed changes do not change the design of the containment isolation valves or the vacuum relief valves and associated PMS logics. Therefore, the containment vacuum relief and containment isolation functions are not affected by the proposed change. Based on the above evaluation in Section 3.2, the staff finds the proposed TS revisions acceptable because the proposed changes continue to provide reasonable assurance of the vacuum relief valves' capability to perform their specified safety functions (isolation and vacuum relief) during a design basis accident. Therefore, the NRC staff finds that the proposed TS changes continue to meet the requirements of GDC 16, GDC 56, and 10 CFR 50.36.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations in 10 CFR 50.91(b)(2), the Georgia State official was notified of the proposed issuance of the amendment on September 24, 2020. 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, "Standards for Protection Against Radiation," and changes surveillance requirements. 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 August 11, 2020 (85 FR 48572). 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.

6.0 CONCLUSION

The staff has concluded, based on the considerations discussed in Section 3.0 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. Southern Nuclear Operating Company, Vogtle Electric Generating Plant Units 3 and 4, "Request for License Amendment: Vacuum Relief Valve Technical Specification Changes" (LAR 20-005), June 19, 2020 (ADAMS Accession No. ML20171A563).

2. Southern Nuclear Operating Company, Vogtle Electric Generating Plant Units 3 and 4, "Supplement to Request for License Amendment: Vacuum Relief Valve Technical Specification Changes" (LAR 20-005S1), September 18, 2020 (ADAMS Accession No. ML20262H206).

3. Vogtle Electric Generating Plant Units 3 and 4, Updated Final Safety Analysis Report, Revision 9, June 15, 2020 (ADAMS Accession No. ML20181A311).

4. Westinghouse Electric Company's AP1000 Design Control Document, Revision 19, June 13, 2011 (ADAMS Accession No. ML11171A500).

5. Vogtle Electric Generating Plant Unit 3, Current Facility Combined License NPF-91, Revised June 23, 2020 (ADAMS Accession No. ML14100A106).

6. Vogtle Electric Generating Plant Unit 4, Current Facility Combined License NPF-92, Revised June 23, 2020 (ADAMS Accession No. ML14100A135).

7. Pressurized Water Reactor Owners Group, "Risk-Informed Evaluation of Extensions to Containment Isolation Valve Completion Times," Revision 2, WCAP-15791-NP-A, June 2008 (ADAMS Accession No. ML082120239).

8. NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Section 6.2.4, "Containment Isolation System," Revision 3, March 2007 (ADAMS Accession No. ML070380197).

9. NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Section 16.0, "Technical Specifications," Revision 3, March 2010 (ADAMS Accession No. ML100351425).

10. NUREG-2194, "Standard Technical Specifications, Westinghouse Advanced Passive 1000 (AP1000) Plants," Volume 1, Revision 0, April 2016 (ADAMS Accession No. ML16110A277) and Volume 2, Revision 0, April 2016 (ADAMS Accession No. ML16110A369).