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SOUTHERN COMPANY

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52-026

ND-16-0728
10 CFR 50.90

U.S. Nuclear Regulatory Commission
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Southern Nuclear Operating Company
Vogtle Electric Generating Plant Units 3 and 4
Request for License Amendment:
Addition of Density Compensation to Reactor Trip System (RTS)
Reactor Coolant Flow Signal (LAR-16-007)

Ladies and Gentlemen:

Pursuant to 10 CFR 52.98(c) and in accordance with 10 CFR 50.90, Southern Nuclear Operating Company (SNC) requests an amendment to the combined licenses for Vogtle Electric Generating Plant (VEGP) Units 3 and 4 (License Numbers NPF-91 and NPF-92, respectively). The requested amendment proposes to depart from approved AP1000 Design Control Document (DCD) Tier 2 information (as incorporated into the Updated Final Safety Analysis Report (UFSAR) as plant-specific DCD information), and also involves changes to the plant-specific Technical Specifications (TS). This submittal requests approval of the license amendment necessary to implement these changes.

The requested amendment proposes to depart from UFSAR text by adding compensation, for changes in reactor coolant density using the ΔT power signal, to the reactor coolant flow input signal for the low reactor coolant flow trip function of the Reactor Trip System (RTS). Additionally, Technical Specification (TS) Surveillance Requirement (SR) 3.3.1.3 is added to the surveillances required for the Reactor Coolant Flow-Low reactor trip in TS Table 3.3.1-1, Function 7.

Enclosure 1 provides the description, technical evaluation, regulatory evaluation (including the Significant Hazards Consideration determination) and environmental considerations for the proposed changes. Enclosure 2 provides markups depicting the requested changes to the licensing basis documents requiring NRC staff approval. Enclosure 3 provides conforming TS Bases changes for reference only. The TS Bases changes are controlled by Technical Specification 5.5.6, "Technical Specifications (TS) Bases Control Program," and are not within the scope of the LAR, but will be updated to be consistent with the changes to the TS proposed in the LAR in accordance with the TS Bases Control Program.

Enclosures:
1) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Request for License Amendment Regarding Addition of Density Compensation to Reactor Trip System (RTS) Reactor Coolant Flow Signal (LAR-16-007)
2) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Proposed Changes to Licensing Basis Documents (LAR-16-007)
3) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Conforming Technical Specification Bases Changes (LAR-16-007) (For Information Only)

SNC requests NRC staff approval of the license amendment by November 18, 2016, to support fit-up and weld of Reactor Coolant System hot leg main loop piping. Delayed approval of this license amendment could result in a delay of dependent construction activities. SNC expects to implement this proposed amendment within the VEGP Units 3 and 4 TS and UFSAR within 30 days of approval of the requested changes. However, in accordance with License Condition 2.D.(9), the technical specifications in Appendix A to these licenses would not become effective until a Commission finding that the acceptance criteria in this license (ITAAC) are met in accordance with 10 CFR 52.103(g). There is no requested amendment to this license condition.

This letter contains no regulatory commitments.

In accordance with 10 CFR 50.91, SNC is notifying the State of Georgia of this LAR by transmitting a copy of this letter and enclosures to the designated State Official.

Should you have any questions, please contact Mrs. Amy C. Chamberlain at (205) 992-6361.

Mr. B. H. Whitley states that he is the Regulatory Affairs Director of Southern Nuclear Operating Company, is authorized to execute this oath on behalf of Southern Nuclear Operating Company and to the best of his knowledge and belief, the facts set forth in this letter are true.

Respectfully submitted,

SOUTHERN NUCLEAR OPERATING COMPANY

B. H. Whitley

BHW/ACC/ljs

Sworn to and subscribed before me this 27th *day of* May, *2016*

Notary Public: Mara Rainville Hamner

My commission expires: 2-18-2020

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Southern Nuclear Operating Company

ND-16-0728

Enclosure 1

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Request for License Amendment Regarding Addition of Density Compensation to Reactor Trip System (RTS) Reactor Coolant Flow Signal (LAR-16-007)

(This Enclosure consists of 14 pages, including this cover page.)

Table of Contents

Pursuant to 10 CFR 52.98(c) and in accordance with 10 CFR 50.90, Southern Nuclear Operating Company (SNC), the licensee for Vogtle Electric Generating Plant (VEGP) Units 3 and 4, requests an amendment to Combined License (COL) Numbers NPF-91 and NPF-92, for VEGP Units 3 and 4, respectively.

1. Summary Description

This license amendment request (LAR) proposes changes that will add compensation to the reactor coolant flow input signal to the Reactor Trip System (RTS) instrumentation for the low reactor coolant flow reactor trip function and add Technical Specification (TS) Surveillance Requirement (SR) 3.3.1.3 to the surveillances required for the Reactor Coolant Flow-Low reactor trip.

The requested amendment involves changes to the Updated Final Safety Analysis Report (UFSAR) in the form of departures from the incorporated plant-specific Design Control Document (PS-DCD) Tier 2 licensing basis information. The proposed changes to the licensing basis also involve changes to COL Appendix A Technical Specifications and the associated Bases.

SNC requests approval of the license amendment necessary to implement the proposed changes to the Tier 2 information and the involved Technical Specifications. SNC requests NRC staff approval of the license amendment by November 18, 2016, to support fit-up and weld of Reactor Coolant System (RCS) hot leg main loop piping. Delayed approval of this license amendment could result in a delay of dependent construction activities.

2. Detailed Description

Background

As described in Updated Final Safety Analysis Report (UFSAR) Subsection 7.1.1, the protection and safety monitoring system (PMS) provides detection of off-nominal conditions and actuation of appropriate safety-related functions necessary to achieve and maintain the plant in a safe shutdown condition. One of the safety actuations of PMS is the safety-related reactor trip function. As described in UFSAR Subsection 7.2.1, reactor trip is a protective function performed by the protection and safety monitoring system when it anticipates an approach of a parameter to its safety limit. The reactor trip function keeps the reactor within the safe region by shutting down the reactor whenever safety limits are approached.

The reactor trip on low reactor coolant flow is designed to protect against departure from nucleate boiling (DNB) in the event of low reactor coolant flow. The flow in each RCS hot leg is measured at the hot leg elbow. The trip on low flow in the RCS hot legs is automatically blocked when reactor power is below the P-10 permissive setpoint. This enhances reliability by minimizing the potential for unnecessary reactor trips at low power. The trip function is automatically reset when reactor power is above the P-10 permissive setpoint. This safety-related reactor trip function is described in UFSAR Subsection 7.2.1.1.3. As described in UFSAR Section 15.3, the low reactor coolant flow reactor trip function is credited with providing protection for the spectrum of events involving decrease in reactor coolant system flow rate.

Westinghouse pressurized water reactors (PWRs) trip on low reactor coolant flow based on RCS elbow tap differential pressure (dP) measurement. The reactor trip on low reactor coolant flow for the AP1000 derives its signals from the RCS hot leg elbow taps. However, this signal will be close to the reactor trip setpoint at zero power (no-load). This difficulty arises for the following reasons:

- Some Westinghouse PWRs use elbow taps in the RCS cold leg. The AP1000 RCS cold leg does not have an elbow, so the dP signal varies with RCS hot leg temperature, which affects the reactor coolant water density.
- The AP1000 has a reactor vessel ΔT at full power of about 75°F (T_{hot}-T_{cold}), which increases the magnitude of the effect of the change in reactor coolant density. The RCS hot leg reactor trip setpoint is 90 percent of the reactor coolant flow with all reactor coolant pumps (RCPs) operating at rated speed at full power conditions. However, the signal, if set for 100 percent of flow at normal full power, will indicate about 92.5 percent flow at zero power, even if all RCPs are operating normally at rated speed, because of the effects enumerated above. Although this reactor trip is automatically blocked when reactor power is below the P-10 permissive setpoint (i.e., 10 percent reactor power), the margin-to-trip (and to partial trip and pre-trip alarms) is considered unacceptably low. To allow for process noise, transmitter drift, and occasional electrical noise spikes, the difference between normal average indicated flow and the trip setpoint should be at least 5 percent flow. The elbow tap dP signal should be compensated (i.e., corrected for density differences) to provide a more accurate measure of reactor coolant flow into the reactor vessel at low power conditions.

Addition of Density Compensation to Reactor Coolant Low Flow Trip Input Signal

To increase the difference between the indicated reactor coolant flow and the setpoint for reactor trip on low reactor coolant flow, a design change is proposed to compensate the reactor coolant flow signal for reactor coolant density differences using an algorithm for power-based compensation to increase the accuracy of indicated reactor coolant flow. Adding power-based compensation reduces the possibility that process signal noise, transmitter drift, and occasional electrical noise spikes can cause spurious reactor trips at low power conditions due to low margin between the measured flow and the low flow trip setpoint. The probability of spurious reactor trips and the accompanying plant transients is decreased by this change, thereby improving plant performance and enhancing plant safety. The flow channels are compensated with the greatest compensation occurring at the lowest power values, reducing to no compensation (compensated flow value = uncompensated flow value) at full power conditions. The change would have no adverse impact on safety, as it continues to provide a reactor trip on low reactor coolant flow within the setpoint and response time assumed in the safety analysis.

The RCS hot leg elbow tap dP signal is compensated (i.e., corrected for density differences) to provide a more accurate measure of reactor coolant flow into the reactor vessel at low power conditions. The change uses the calibrated ΔT power signal available in each division as a

simple multiplier (equivalent to gain and bias) for the measured (uncompensated) dP signal, that is:

$$\text{Comp dP} = (\text{Uncomp dP}) \times (C_0 - C_1 \times \text{Power})$$

Where:

Comp dP is the compensated differential pressure;

Uncomp dP is the uncompensated differential pressure;

Power = ΔT power , as defined in UFSAR Subsection 7.2.1.1.3, such that it is 1.00 at rated thermal power (RTP);

C_0 and C_1, are coefficients selected such that the compensation factor on the dP signal = 1.00 at RTP and at programmed no-load conditions.

Density compensation of the hot leg dP, using the calibrated ΔT power signal, produces an indication of 100 percent reactor coolant flow at both hot zero power and at rated thermal power, providing an acceptably accurate flow signal, and is more accurate than uncompensated hot leg dP currently in the ***AP1000*** design. Density compensation using the calibrated ΔT power signal is also referred to synonymously as "power compensation."

This change will be reflected in UFSAR Subsection 7.2.1.1.3.

Adding Technical Specification Surveillance Requirement 3.3.1.3 to Reactor Coolant Low Flow Trip Required Surveillances

The proposed activity adds TS SR 3.3.1.3 to the surveillances required for the Reactor Coolant Flow-Low reactor trip in TS Table 3.3.1-1, Function 7. The low flow trip uses the RCS hot leg dP as an input signal and this signal is compensated for reactor coolant density using the calculated ΔT power. SR 3.3.1.3 compares the calorimetric heat balance to the calculated ΔT power in each PMS division every 24 hours to assure acceptable ΔT power calibration. As such, the surveillance is also required to support operability of the Reactor Coolant Flow – Low trip function.

This change will be reflected in changes to COL Appendix A Table 3.3.1-1.

Licensing Basis Change Descriptions

Table 1, below, describes the licensing basis changes associated with the proposed addition of compensation of the RCS hot leg dP to correct for changes in reactor coolant density, using the calibrated ΔT power signal for the low reactor coolant flow trip function.

Table 1: Proposed Licensing Basis Changes

UFSAR Tier 2 Changes	
Text or Table	**Description of the Proposed Change**
Subsection 7.2.1.1.3, "Core Heat Removal Trips – Reactor Trip on Low Reactor Coolant Flow"	Revised to describe that the reactor coolant flow signal input to the flow-low reactor trip is compensated for changes in reactor coolant density using ΔT power.
Involved COL Appendix A Technical Specifications	
COL Appendix A Table 3.3.1-1, "Reactor Trip System Instrumentation" Function 7, "Reactor Coolant Flow – Low"	Adds SR 3.3.1.3 to the "Surveillance Requirements" column.
The following conforming Technical Specification Bases changes are provided for information only	
Associated Technical Specification Bases B3.3.1, "Reactor Trip System (RTS) Instrumentation," Function 7, "Reactor Coolant Flow – Low"	Revised to describe that the reactor coolant flow signal input to the flow-low reactor trip is compensated for changes in reactor coolant density using ΔT power.

3. Technical Evaluation

The reactor trip is a protective function performed by the protection and safety monitoring system (PMS) when it anticipates an approach of a parameter to its safety limit. The reactor trip function keeps the reactor within the safe region by shutting down the reactor whenever safety limits are approached. The reactor trip on low reactor coolant flow protects against departure from nucleate boiling (DNB) in the event of low reactor coolant flow. The flow in each RCS hot leg is measured at the hot leg elbow for the low reactor coolant flow reactor trip. The trip on low flow in the RCS hot legs is automatically blocked when reactor power is below the P-10 permissive setpoint. This enhances reliability by minimizing the potential for unnecessary reactor trips at low power. The trip function is automatically reset when reactor power is above the P-10 permissive setpoint. This safety-related reactor trip function is part of the PMS safety actuation core heat removal trips.

The proposed design change adds compensation, to account for changes in reactor coolant density due to changes in reactor coolant hot leg temperature, to the reactor coolant flow signal input to the low reactor coolant flow reactor trip, to reduce the potential for spurious reactor trips at low power conditions. The addition of density compensation provides a flow signal which increases the accuracy for the signal. The change does not involve a procedure or method of control that adversely affects the performance of a design function. Therefore, this change does not adversely affect the performance of a design function as described in the plant-specific Design Control Document (PS-DCD), or Updated Final Safety Analysis Report (UFSAR).

The proposed change adds Technical Specification (TS) Surveillance Requirement (SR) 3.3.1.3 to the surveillances required for TS Table 3.3.1-1, Function 7, the Reactor Coolant Flow-Low reactor trip. The low flow trip uses the hot leg dP as an input signal and this signal is compensated for reactor coolant density changes using the calculated ΔT power. SR 3.3.1.3 compares the calorimetric heat balance to the calculated ΔT power in each PMS Division every 24 hours to assure acceptable ΔT power calibration. As such, the surveillance is also required to support operability of the Reactor Coolant Flow – Low trip function.

The low reactor coolant flow reactor trip will continue to protect the reactor core from DNB conditions. The change to power compensate the reactor coolant flow signal does not impact the response of the plant to severe accidents. No system design function is adversely affected. The change does not adversely affect any active or passive safety-related function, defense-in-depth (i.e., beyond design basis) safety function, or an ex-vessel severe accident (EVSA) feature. No Probabilistic Risk Assessment (PRA), DCD Chapter 19, change is needed. The change does not affect an EVSA function, described in UFSAR Appendix 19B.

The proposed change does not affect any function or feature used for the prevention and mitigation of accidents or their safety analyses. The proposed change does not change the assumed reactor trip response time values assumed in the accident analyses. No safety-related structure, system, component (SSC) or function is involved. The proposed change does not involve nor interface with any SSC accident initiator or initiating sequence of events related to the accidents evaluated in the UFSAR.

The proposed change does not affect the radiological source terms (i.e., amounts and types of radioactive materials released, their release rates and release durations) used in the accident analyses. The equipment involved in this proposed change does not affect safety-related

equipment or a fission product barrier. No system or design function or equipment qualification is adversely affected by the proposed changes. The change does not result in a new failure mode, malfunction or sequence of events that could adversely affect a radioactive material barrier or safety-related equipment. The proposed change does not allow for a new fission product release path, result in a new fission product barrier failure mode, or create a new sequence of events that would result in significant fuel cladding failures.

The SSCs affected by this license amendment request are not used to contain, control, channel, monitor, process or release radioactive and non-radioactive materials. The types and quantities of expected effluents are not changed, and no effluent release path is adversely affected by the proposed changes. Therefore, radioactive or non-radioactive material effluents are not affected by the proposed change.

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

Summary

The proposed change adds compensation, for changes in reactor coolant density using the ΔT power signal, to the reactor coolant flow input signal for the low reactor coolant flow reactor trip to increase the difference between indicated reactor coolant flow and the low reactor coolant flow trip setpoint and reduce spurious reactor trips. The change also adds SR 3.3.1.3 to TS Table 3.3.1-1, Function 7, Reactor Coolant Flow-Low trip function. The proposed changes would not adversely affect any safety-related equipment or function, design function, radioactive material barrier or safety analysis.

4. Regulatory Evaluation

4.1 Applicable Regulatory Requirements/Criteria

10 CFR 52.98(f) requires NRC approval for any modification to, addition to, or deletion from the terms and conditions of a Combined License (COL). This activity involves a change to COL Appendix A, Technical Specifications; therefore, this activity requires a proposed amendment to the COL. Accordingly, NRC approval is required prior to making the plant-specific changes in this license amendment request.

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

10 CFR 52, Appendix D, VIII.C.6 states that after issuance of a license, "Changes to the plant specific TS (Technical Specifications) will be treated as license amendments under 10 CFR 50.90." 10 CFR 50.90 addresses the applications for amendments of licenses, construction permits and early site permits. As discussed above, a change to COL Appendix A Table 3.3.1-1 is requested, and thus a license amendment request (LAR) (as supplied herein) is required.

10 CFR Part 50, Appendix A General Design Criteria (GDC) 10, "Reactor design" requires that the reactor core and associated coolant, control, and protection systems shall be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences. The proposed change to the low reactor coolant flow trip input signal and COL Appendix A Table 3.3.1-1 requirements, maintains the design capability and margin of the low reactor coolant flow reactor trip to assure the fuel design limits are not exceeded during normal operations and anticipated operational occurrences. Therefore, the proposed change complies with the requirements of GDC 10.

10 CFR Part 50, Appendix A GDC 20, "Protection system functions" requires that the protection system shall be designed (1) to initiate automatically the operation of appropriate systems including the reactivity control systems, to assure that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences and (2) to sense accident conditions and to initiate the operation of systems and components important to safety. The proposed change to the low reactor coolant flow trip input signal and COL Appendix A Table 3.3.1-1 requirements, assures the continued ability of the low reactor coolant flow reactor trip to provide protection system inputs of reactor coolant flow anomalies and initiate the operation of the reactor trip system to protect the reactor from departure from nucleate boiling. Therefore, the proposed change complies with the requirements of GDC 20.

4.2 Precedent

No precedent is identified.

4.3 Significant Hazards Consideration Determination

The proposed change adds compensation, for changes in reactor coolant density using the ΔT power signal, to the reactor coolant flow input signal for the low reactor coolant flow reactor trip to increase the difference between indicated reactor coolant flow and the low reactor coolant flow trip setpoint and reduce spurious reactor trips. The change also adds Surveillance Requirement (SR) 3.3.1.3 to Technical Specification (TS) Table 3.3.1-1, Function 7, Reactor Coolant Flow-Low trip function.

The requested amendment proposes a change to Updated Final Safety Analysis Report (UFSAR) Tier 2 information, which involves a change to the COL Appendix A, Technical Specifications.

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

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

Response: No

The proposed change adds compensation, for changes in reactor coolant density using the ΔT power signal, to the reactor coolant flow input signal for the low reactor coolant flow reactor trip function of the reactor trip system (RTS). The proposed change also adds TS SR 3.3.1.3 to the surveillances required for the Reactor Coolant Flow-Low reactor trip specified in TS Table 3.3.1-1. SR 3.3.1.3 compares the calorimetric heat balance to the calculated ΔT power in each Protection and Safety Monitoring System (PMS) division every 24 hours to assure acceptable ΔT power calibration. As such, the surveillance is also required to support operability of the Reactor Coolant Flow – Low trip function. This change to the low reactor coolant flow trip input signal assures that the reactor will trip on low reactor coolant flow when the requisite conditions are met, and minimize spurious reactor trips and the accompanying plant transients. The change to the COL Appendix A Table 3.3.1-1 aligns the surveillance of the Reactor Coolant Flow-Low trip with the addition of the compensation, for changes in reactor coolant density using ΔT power to the flow input signal to the trip. These changes do not affect the operation of any systems or equipment that initiate an analyzed accident or alter any structures, systems, and components (SSC) accident initiator or initiating sequence of events.

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

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

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

Response: No

The proposed changes do not affect the operation of any systems or equipment that may initiate a new or different kind of accident, or alter any SSC such that a new accident initiator or initiating sequence of events is created. The proposed change adds compensation, for changes in reactor coolant density using ΔT power signal, to the reactor coolant flow input signal to the low reactor coolant flow reactor trip function of the RTS. The proposed change also adds TS SR 3.3.1.3 to the surveillances required for the Reactor Coolant Flow-Low reactor trip specified in TS Table 3.3.1-1. SR 3.3.1.3 compares the calorimetric heat balance to the calculated ΔT power in each PMS division every 24 hours to assure acceptable ΔT power calibration. As such, the surveillance is also required to support operability of the Reactor Coolant Flow – Low trip function. The proposed change to the low reactor coolant flow reactor trip input signal does not alter the design function of the low flow reactor trip. The change to the COL Appendix A Table 3.3.1-1 aligns the surveillance of the Reactor Coolant Flow-Low trip with the addition of compensation, for changes in reactor coolant density using ΔT power to the flow input signal to the trip. Consequently, because the low reactor coolant flow trip functions are unchanged, there are no adverse effects that could create the possibility of a new or different kind of accident from any previously evaluated in the UFSAR.

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

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

Response: No

The proposed change adds compensation, for changes in reactor coolant density using ΔT power signal, to the reactor coolant flow input signal for the low reactor coolant flow trip function of the RTS. The proposed change also adds TS SR 3.3.1.3 to the surveillances required for the Reactor Coolant Flow-Low reactor trip specified in TS Table 3.3.1-1. SR 3.3.1.3 compares the calorimetric heat balance to the calculated ΔT power in each PMS division every 24 hours to

assure acceptable ΔT power calibration. As such, the surveillance is also required to support operability of the Reactor Coolant Flow – Low trip function. The proposed changes do not alter any applicable design codes, code compliance, design function, or safety analysis. Consequently, no safety analysis or design basis acceptance limit/criterion is challenged or exceeded by the proposed change, thus the margin of safety is not reduced.

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

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

4.4 Conclusions

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public. Pursuant to 10 CFR 50.92, the requested change does not involve a Significant Hazards Consideration.

5. Environmental Considerations

The details of the proposed changes are provided in Sections 2 and 3 of this licensing amendment request.

The proposed changes would add compensation, for changes in reactor coolant density using ΔT power signal, to the low reactor coolant flow reactor trip input signal for the low reactor coolant flow trip function of the Reactor Trip System (RTS).

The proposed change requires changes to Updated Final Safety Analysis Report (UFSAR) information, which involve changes to COL Appendix A.

This review has determined the proposed change requires an amendment to the COL. However, a review of the anticipated construction and operational effects of the requested amendment has determined the requested amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9), in that:

(i) There is no significant hazards consideration.

As documented in Section 4.3, Significant Hazards Consideration Determination, of this license amendment request, an evaluation was completed to determine whether or not a significant hazards consideration is involved by focusing on the three standards set forth

in 10 CFR 50.92, "Issuance of amendment." The Significant Hazards Consideration determined that (1) the requested amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated; (2) the requested amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated; and (3) the requested amendment does not involve a significant reduction in a margin of safety. Therefore, it is concluded that the requested amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of "no significant hazards consideration" is justified.

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

The proposed change adds compensation, for changes in reactor coolant density using ΔT power signal, to the low reactor coolant flow reactor trip input signal. The proposed change also adds TS SR 3.3.1.3 to the surveillances required for the Reactor Coolant Flow-Low reactor trip specified in TS Table 3.3.1-1. SR 3.3.1.3 compares the calorimetric heat balance to the calculated ΔT power in each PMS division every 24 hours to assure acceptable ΔT power calibration. As such, the surveillance is also required to support operability of the Reactor Coolant Flow – Low trip function. The proposed changes are unrelated to any aspect of plant construction or operation that would introduce any change to effluent types (e.g., effluents containing chemicals or biocides, sanitary system effluents, and other effluents), or affect any plant radiological or non-radiological effluent release quantities. Furthermore, the proposed changes do not affect any effluent release path or diminish the functionality of any design or operational features that are credited with controlling the release of effluents during plant operation. Therefore, it is concluded that the requested amendment does not involve a significant change in the types or a significant increase in the amounts of any effluents that may be released offsite.

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

The proposed change adds compensation, for changes in reactor coolant density using ΔT power signal, to the low reactor coolant flow reactor trip input signal. The proposed change also adds TS Surveillance Requirement (SR) 3.3.1.3 to the surveillances required for the Reactor Coolant Flow-Low reactor trip specified in TS Table 3.3.1-1. SR 3.3.1.3 compares the calorimetric heat balance to the calculated ΔT power in each PMS division every 24 hours to assure acceptable ΔT power calibration. As such, the surveillance is also required to support operability of the Reactor Coolant Flow – Low trip function. Plant radiation zones (addressed in UFSAR Section 12.3) are not affected, and controls under 10 CFR 20 preclude a significant increase in occupational radiation

exposure. Therefore, the requested amendment does not involve a significant increase in individual or cumulative occupational radiation exposure.

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

6. References

None

Southern Nuclear Operating Company

ND-16-0728

Enclosure 2

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Proposed Changes to Licensing Basis Documents

(LAR-16-007)

Note: Added text is Denoted by Underlined Blue Text

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

UFSAR Subsection 7.2.1.1.3 *Core Heat Removal Trips, Reactor Trip on Low Reactor Coolant Flow*

Revise Tier 2 information by adding compensation to the flow signal, as shown below:

****

This trip protects against departure from nucleate boiling in the event of low reactor coolant flow. Flow in each hot leg is measured at the hot leg elbow. **Each flow signal is compensated for changes in reactor coolant density using the ΔT power signal.** The trip on low flow in the hot legs is automatically blocked when reactor power is below the P-10 permissive setpoint. This enhances reliability by preventing unnecessary reactor trips. The trip function is automatically reset when reactor power is above the P-10 setpoint.

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Technical Specification (TS) 3.3.1 Table 3.3.1-1 add Surveillance Requirement (SR) 3.3.1.3 to Reactor Coolant Flow - Low

(See next page for mark-up)

Table 3.3.1-1 (page 2 of 2)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS
7. Reactor Coolant Flow – Low	1[(b)]	4 per hot leg	E	SR 3.3.1.1 SR 3.3.1.3 SR 3.3.1.6 SR 3.3.1.8 SR 3.3.1.11
8. Reactor Coolant Pump (RCP) Bearing Water Temperature – High	1,2	4 per RCP	D	SR 3.3.1.1 SR 3.3.1.6 SR 3.3.1.8 SR 3.3.1.11
9. RCP Speed – Low	1[(b)]	4 (1/pump)	E	SR 3.3.1.1 SR 3.3.1.6 SR 3.3.1.8 SR 3.3.1.11
10. Steam Generator (SG) Narrow Range Water Level – Low	1,2	4 per SG	D	SR 3.3.1.1 SR 3.3.1.6 SR 3.3.1.8 SR 3.3.1.11
11. Steam Generator (SG) Narrow Range Water Level – High 2	1,2[(c)]	4 per SG	D	SR 3.3.1.1 SR 3.3.1.6 SR 3.3.1.8 SR 3.3.1.11
12. Passive Residual Heat Removal Actuation	1,2	4 per valve	D	SR 3.3.1.9 SR 3.3.1.10 SR 3.3.1.11

(b) Above the P-10 (Power Range Neutron Flux) interlock.

(c) Above the P-11 (Pressurizer Pressure) interlock.

Southern Nuclear Operating Company

ND-16-0728

Enclosure 3

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Conforming Technical Specification Bases Changes

(LAR-16-007)

(For Information Only)

Note: Added text is Denoted by Underlined Blue Text

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

Conforming Technical Specification Bases B3.3.1, "Reactor Trip System (RTS) Instrumentation," Function 7, "Reactor Coolant Flow – Low" is updated to add compensation to the flow signal

Plant-Specific Technical Specifications (TS) Bases MARKUPS are provided for information only on the following page.

BASES

APPLICABLE SAFETY ANALYSES, LCOs, and APPLICABILITY (continued)

In MODE 1 when there is a potential for overfilling the pressurizer, the Pressurizer Water Level – High 3 trip must be OPERABLE. This trip Function is automatically enabled on increasing power by the P-10 interlock. On decreasing power, this trip Function is automatically blocked below P-10. Below the P-10 setpoint, transients which could raise the pressurizer water level will be slow and the operator will have sufficient time to evaluate plant conditions and take corrective actions.

7. Reactor Coolant Flow – Low

The Reactor Coolant Flow – Low trip Function ensures that protection is provided against violating the DNBR limit due to low flow in one or more RCS hot legs. Above the P-10 setpoint, a loss of flow in any RCS hot leg will actuate a Reactor trip.

Each RCS hot leg has four flow detectors to monitor flow. Each flow signal is compensated for changes in reactor coolant density using the ΔT power signal. The Trip Setpoint reflects only steady state instrument uncertainties as the detectors do not provide primary protection for any event that results in a harsh environment.

The LCO requires four Reactor Coolant Flow – Low channels per hot leg to be OPERABLE in MODE 1 above P-10. Four OPERABLE channels are provided to permit one channel in trip or bypass indefinitely and still ensure no single random failure will disable this trip Function.

In MODE 1 above the P-10 setpoint, when a loss of flow in one RCS hot leg could result in DNB conditions in the core, the Reactor Coolant Flow – Low trip must be OPERABLE.

8. Reactor Coolant Pump (RCP) Bearing Water Temperature – High

The RCP Bearing Water Temperature – High reactor trip Function ensures that protection is provided against violating the DNBR limit due to a loss of flow in one RCS cold leg. The Trip Setpoint reflects only steady state instrument uncertainties as the detectors do not provide primary protection for any event that results in a harsh environment.

The LCO requires four RCP Bearing Water Temperature – High channels per RCP to be OPERABLE in MODE 1 or 2. Four channels are provided to permit one channel in trip or bypass indefinitely and still ensure no single random failure will disable this trip Function.