



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

SAFETY EVALUATION BY THE OFFICE OF NEW REACTORS

RELATED TO AMENDMENT NOS. 153 AND 152

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 August 10, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18222A254), Southern Nuclear Operating Company, Inc. (SNC) requested that the U.S. Nuclear Regulatory Commission (NRC) amend Vogtle Electric Generating Plant (VEGP) Units 3 and 4, Combined License (COL) Nos. NPF-91 and NPF-92, respectively. License Amendment Request (LAR) 18-020 requested changes to COL Appendix A, Technical Specifications (TS).

The LAR proposed changes to revise TS Limiting Condition for Operation (LCO) 3.1.8, "Physics Tests Exception – Mode 2," to include Function 4 as one of the LCO 3.3.1, "Reactor Trip System (RTS) Instrumentation," functions where the number of required channels may be reduced to 3 during the performance of physics tests. Additionally, SNC requested to revise LCO 3.8.3, "Inverters – Operating," Note 1 nomenclature from "Class 1E constant voltage source transformer" to "Class 1E voltage regulating transformer." No structure, system, component, design function, or analysis as described in the UFSAR would be affected.

2.0 REGULATORY EVALUATION

LAR 18-020 requested changes to VEGP Units 3 and 4 COL Appendix A, TS, to revise TS LCO 3.1.8, "Physics Tests Exception – Mode 2," and TS LCO 3.8.3, "Inverters – Operating." The staff considered the following regulatory requirements in reviewing the LAR.

10 CFR Part 52, Appendix D, 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 addresses the application for amendment of license, construction permit, or early site permit. The proposed LAR requires changes to the TS, and therefore an LAR is required to be submitted for NRC approval.

10 CFR 50.36, "Technical specifications," 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. TS must contain: (1) safety limits and limiting safety system settings; (2) limiting conditions for operation; (3) surveillance requirements; (4) design features; and (5) administrative controls. This regulation is applicable to the evaluation of this LAR because changes to the TS are proposed in this LAR.

10 CFR Part 50, Appendix A, General Design Criterion (GDC) 13, "Instrumentation and control," requires that instrumentation shall be provided to monitor variables and systems over their anticipated ranges for normal operation, for anticipated operational occurrences, and for accident conditions as appropriate to assure adequate safety, including those variables and systems that can affect the fission process, the integrity of the reactor core, the reactor coolant pressure boundary, and the containment and its associated systems. Appropriate controls shall be provided to maintain these variables and systems within prescribed operating ranges. This regulatory requirement is applicable for the evaluation of this LAR because the proposed changes in this LAR impact the operability of the affected instrumentation functions.

10 CFR 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. This regulatory requirement is also applicable for the review of this LAR because the proposed changes in this LAR are related to the plant safety protection functions.

10 CFR 50 Appendix A, GDC 21, "Protection system reliability and testability," requires, in part, that the protection system shall be designed for high functional reliability and inservice testability commensurate with the safety functions to be performed. Redundancy and independence designed into the protection system shall be sufficient to assure that (1) no single failure results in loss of the protection function and (2) removal from service of any component or channel does not result in loss of the required minimum redundancy unless the acceptable reliability of operation of the protection system can be otherwise demonstrated. This regulatory requirement is applicable for the safety evaluation of this LAR because the proposed changes in this LAR are related to this regulation on the single failure criterion for the plant safety protection system.

3.0 TECHNICAL EVALUATION

In LAR 18-020, SNC proposes to change TS LCO 3.1.8, "Physics Tests Exceptions – Mode 2," to include Function 4 as one of the LCO 3.3.1, "RTS Instrumentation," functions where the number of required channels may be reduced to 3 during the performance of physics tests. Additionally, the LAR proposes to revise LCO 3.8.3, "Inverters – Operating," to make an editorial nomenclature change from "constant voltage source transformer" to "voltage regulating transformer."

SNC's proposed changes are as shown in Bold text below:

- LCO 3.1.8 During the performance of PHYSICS TESTS, the requirements of:

LCO 3.1.3 "Moderator Temperature Coefficient (MTC),"
LCO 3.1.4 "Rod Group Alignment Limits,"
LCO 3.1.5 "Shutdown Bank Insertion Limits,"
LCO 3.1.6 "Control Bank Insertion Limits," and
LCO 3.4.2 "RCS Minimum Temperature for Criticality"

may be suspended, and the number of required channels for LCO 3.3.1, "Reactor Trip System (RTS) Instrumentation," Functions 1, 2, **and 3-3, and 4** may be reduced to 3 provided:

* ... *

- LCO 3.8.3 The Division A, B, C, and D inverters shall be OPERABLE.

NOTES

One inverter may be disconnected from its associated DC bus for ≤ 72 hours to perform an equalizing charge on its associated battery, providing:

1. The associated instrument and control bus is energized from its Class 1E ~~constant voltage source~~ **voltage regulating** transformer; and
 2. All other AC instrument and control buses are energized from their associated OPERABLE inverters.
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SNC's explanation for its proposed changes is based on references to applicable UFSAR sections and specific TS requirements.

Regarding TSs, the application states,

TS LCO 3.0.7 describes that Test Exception LCO 3.1.8 allows specified TS requirements to be changed to permit performance of special tests and operations. Unless otherwise specified, all other TS requirements remain unchanged.

TS LCO 3.1.8 identifies several TS LCOs that may be suspended during the conduct of physics testing, and specific reactor trip instrumentation functions defined in TS LCO 3.3.1, "Reactor Trip System Instrumentation," for which the required number of instrumentation channels may be reduced from 4 channels to 3 channels to accommodate the physics testing. Specifically, TS LCO 3.1.8 allows reducing the number of required channels (from 4 channels to 3 channels) for the following RTS instrumentation functions to accommodate low power physics testing:

- Function 1, Power Range Neutron Flux
- Function 2, Power Range Neutron Flux High Positive Rate
- Function 3, Overtemperature ΔT

TS 3.1.8 allows for reducing the number of channels required during physics testing to accommodate the removal of one channel of the power range neutron flux detector trip function from service. This will allow the output from one power range detector to be connected to the Advanced Digital Reactivity Computer (ADRC), which is required to acquire reactivity data during physics testing.

3.1 TECHNICAL EVALUATION OF PHYSICS TEST EXCEPTION

The information presented by SNC in LAR 18-020 was evaluated by the staff for its completeness, quality, and clarity. In Section 2 of Enclosure 1 to LAR 18-020, SNC proposed changes to modify TS LCO 3.1.8, Physics Tests Exceptions – Mode 2. SNC proposed a change to include Function 4 as one of the LCO 3.3.1, RTS Instrumentation, functions where the number of required channels may be reduced to 3 during the performance of physics tests.

In Section 2 of Enclosure 1 to LAR 18-020, SNC states that RTS Function 3 (Overtemperature ΔT) is affected by the removal of a corresponding channel of power range neutron flux detectors, as required during physics testing, because the power range neutron flux detectors provide an input (penalty function or $f(\Delta I)$) to the Overtemperature ΔT RTS trip setpoints to account for the potential presence of an adverse axial neutron flux distribution. SNC identified that RTS Function 4 (Overpower ΔT) also incorporates the penalty function into its trip logic to account for adverse axial neutron flux distribution as detected by its corresponding power range neutron detectors. Therefore, like the Overtemperature ΔT RTS Function, the removal of a single channel of power range neutron detectors, as required during physics testing, also affects its corresponding Overpower ΔT trip channel. SNC proposed to include RTS Function 4 in the list of RTS functions allowed to be reduced from 4 channels to 3 channels during physics testing conducted under the provisions of TS 3.1.8.

In Section 2 of Enclosure 1 to LAR 18-020, SNC states the proposed change to add RTS Function 4 to the list of RTS trip functions for which the required number of channels may be reduced from 4 channels to 3 channels is consistent with the exceptions provided for RTS Functions 1, 2, and 3, which are also affected by the removal of a single power range neutron flux detector channel during physics testing. Thus, relaxation of the number of channels (from 4 channels to 3 channels) for the Overpower ΔT trip function is needed to support physics testing, and is consistent with the treatment of RTS Functions 1, 2, and 3 for performance of physics

testing and should be addressed in TS 3.1.8. The staff reviewed the related TS LCO 3.1.8 and LCO 3.3.1 list of RTS Functions and confirmed that including RTS Function 4 in the list of RTS trip functions for which the required number of channels may be reduced from 4 channels to 3 channels is consistent with the exceptions provided for RTS Functions 1, 2, and 3.

In Section 2 of Enclosure 1 to LAR 18-020, SNC states the Overpower ΔT trip occurs when the two out of the four Overpower ΔT trip channel logic provides a trip signal and that the bypass of a single channel, as required during physics testing, in a two out of the four trip system results in the logic system operating as a two out of three trip system. SNC further explains that with a single channel of a two out of four trip system bypassed or tripped, the resultant configuration continues to meet the single failure criterion as required in GDC 21. The staff reviewed the related trip system logic and confirms that the resultant configuration, with one channel bypassed for physics tests, an additional single failure will not prevent the trip system from fulfilling its design function as required in GDC 13 and GDC 20.

Including RTS Function 4 in the list of RTS trip functions for which the required number of channels may be reduced from 4 channels to 3 channels is consistent with the exceptions provided for RTS Functions 1, 2, and 3 and the single failure criterion is met with one channel bypassed for physics testing. Given this, the staff finds that the RTS continues to satisfy GDC 13 and GDC 20 because the Overpower ΔT reactor trip continues to provide assurance that specified acceptable fuel design limits are not exceeded during overpower conditions. Accordingly, Staff finds the proposed changes to TS LCO 3.1.8 acceptable.

3.2 TECHNICAL EVALUATION OF VOLTAGE REGULATING TRANSFORMER NOMENCLATURE

TS LCO 3.8.3, "Inverter – Operating," Note 1 identifies the Class 1E transformer as the "Class 1E constant voltage source transformer," while in other instances within the licensing basis, these transformers are referred to as "Class 1E voltage regulating transformer." To achieve consistency in terminology within other references in the licensing basis, SNC proposed to revise the nomenclature in TS 3.8.3, Note 1, to the "Class 1E voltage regulating transformer."

As described in UFSAR Subsection 8.3.2.1.1.2, the Class 1E voltage regulating transformers provide a backup source of power to the Class 1E 208Y/120 VAC instrument and control power distribution panels. Division A and D each consist of one Class 1E inverter associated with an instrument and control distribution panel and a backup voltage regulating transformer with a distribution panel. One inverter is powered by the 24-hour battery bank switchboard and the other, by the 72-hour battery bank switchboard.

SNC proposed to revise TS LCO 3.8.3, Note 1 nomenclature from "Class 1E constant voltage source transformer" to "Class 1E voltage regulating transformer," to be consistent with the terminology used in the UFSAR.

The information presented by SNC in LAR 18-020 was evaluated by staff for its completeness, quality, and clarity. No new technical review of the designated changes proposed to be modified by this LAR was required or performed. The proposed changes to TS LCO 3.8.3, Note 1 is administrative in nature, as it changes only the terminology used to name the subject

transformer. As part of LAR 18-020, SNC did not request any changes to design information; SNC merely requested changes to the terminology used elsewhere in the UFSAR. The proposed changes to TS LCO 3.8.3, Note 1, are to correct inconsistencies or editorial errors. There are no changes to the design, functional capabilities, method for performing a function, design analysis, safety analysis, or UFSAR information involved, and thus, the requested changes do not affect any design functions. The proposed changes do not involve a change to the method of evaluation for establishing design bases or safety analyses. Tests, experiments, and procedures described in the licensing basis were not changed by these departures. Staff reviewed LAR 18-020 and confirmed that it provides consistency between the plant-specific TS and the UFSAR.

Based on these findings, the staff concludes that there is reasonable assurance that the requirements of GDC 13, GDC 20, GDC 21, and 10 CFR 50.36 will continue to be met. Therefore, the staff finds the proposed changes acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations in 10 CFR 50.91(b)(2), on January 7, 2019, the Georgia State official was consulted. 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." 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. Also, 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 (83 FR 48467, dated September 25, 2018). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Under 10 CFR 51.22(b), no environmental impact statement or environmental assessment needs to 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 and confirming that these changes do not change an analysis methodology, assumptions, or the design itself, that: (1) the health and safety of the public will not be endangered by construction and 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 to be acceptable.

7.0 REFERENCES

1. Southern Nuclear Operating Company, Vogtle Electric Generating Plant Units 3 and 4, Request for License Amendment: Technical Specification Changes for Physics Tests Exceptions and Nomenclature (LAR-18-020), dated August 10, 2018 (ADAMS Accession No. ML18222A254).
2. Vogtle Units 3 and 4 Updated Final Safety Analysis Report, Tier 1, Technical Requirements Manual and Technical Specifications Bases Annual Submittal, dated June 15, 2018 (ADAMS Accession No. ML18179A227).
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).