



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

SAFETY EVALUATION BY THE OFFICE OF NEW REACTORS
RELATED TO AMENDMENT NOS. 172 AND 170
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 18, 2019 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19169A350), 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. License Amendment Request (LAR) 19-012 requested changes to the COL Appendix A Technical Specifications (TS).

The LAR proposes changes to TS 3.7.11, Spent Fuel Pool Boron Concentration, Applicability and Required Actions to eliminate an allowance to exit the Applicability of Limiting Condition of Operation (LCO) 3.7.11, Spent Fuel Pool Boron Concentration, once a spent fuel pool storage verification had been performed. The requested amendment also proposes to eliminate TS 3.7.11 Required Action A.2.2, which provides an option to perform a spent fuel pool storage verification in lieu of restoring spent fuel pool boron concentration to within limits.

2.0 REGULATORY EVALUATION

The spent fuel pool provides storage for spent fuel. The spent fuel is stored in high density racks which include integral neutron absorbing material to maintain the required degree of

subcriticality. The design of the racks is such that effective neutron multiplication factor (k-effective) remains less than or equal to 0.95 under design basis conditions, including fuel handling accidents. Soluble boron in the spent fuel pool is used as reactivity credits. LAR 19-012 involves changes to the COL Appendix A TS LCO 3.7.11, Spent Fuel Pool Boron Concentration, Applicability and Required Actions to eliminate an allowance to exit the Applicability of LCO 3.7.11, Spent Fuel Pool Boron Concentration, once a spent fuel pool storage verification had been performed. The requested amendment also proposes to eliminate TS LCO 3.7.11 Required Action A.2.2, which provides an option to perform a spent fuel pool storage verification in lieu of restoring spent fuel pool boron concentration to within limits.

The staff considered the following regulatory requirements in reviewing the LAR 19-012.

Title 10 of the *Code of Federal Regulations* (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 in the TS, and therefore a 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. In general, 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.

10 CFR 50.68(b)(4) requires that, if credit is taken for soluble boron, the k-effective of the spent fuel storage racks loaded with fuel of the maximum fuel assembly reactivity must not exceed 0.95, at a 95 percent probability, 95 percent confidence level, if flooded with borated water, and the k-effective must remain below 1.0 (subcritical), at a 95 percent probability, 95 percent confidence level, if flooded with unborated water.

10 CFR Part 50, Appendix A, GDC 60, "Control of releases of radioactive materials to the environment," requires that the nuclear power unit design include means to control suitably the release of radioactive materials in gaseous and liquid effluents and to handle radioactive solid wastes produced during normal reactor operation, including anticipated operational occurrences.

10 CFR Part 50, Appendix A, GDC 61, "Fuel storage and handling and radioactivity control," requires that fuel storage and handling, radioactive waste, and other systems which may contain radioactivity be designed to assure adequate safety under normal and postulated accident conditions.

10 CFR Part 50, Appendix A, GDC 62, "Prevention of criticality in fuel storage and handling," requires that criticality in the fuel storage and handling system be prevented by physical systems or processes, preferably by use of geometrically safe configurations.

3.0 TECHNICAL EVALUATION

3.1 TECHNICAL EVALUATION OF THE REQUESTED CHANGES

On page 3 of 11 in LAR 19-012, SNC proposed a change to "the COL Appendix A, Technical Specifications (TS) to eliminate an allowance to exit the Applicability of Limiting Condition of

Operation (LCO) 3.7.11, Spent Fuel Pool Boron Concentration, once a spent fuel pool storage verification had been performed.” The change would modify the applicability of the LCO by eliminating “the concurrent condition for spent fuel pool storage verification not having been performed as a condition requiring maintaining the spent fuel pool boron concentration above the required limit.” The proposed change would also remove TS 3.7.11 Required Action A.2.2, which provides an option to perform a spent fuel pool storage verification instead of option A.2.1 for restoring spent fuel pool boron concentration to within limits.

Page 9.1-4 of the Updated Final Safety Analysis Report (UFSAR) Subsection 9.1.2.1, “Design Bases,” states that the “Spent fuel is stored in high density racks which include integral neutron absorbing material to maintain the required degree of subcriticality. The racks are designed to store fuel of the maximum design basis enrichment. Each rack in the spent fuel pool consists of an array of cells interconnected to each other at several elevations and to a thick base plate at the bottom elevation. These rack modules are free-standing, neither anchored to the pool floor nor braced to the pool wall. The spent fuel storage racks include storage locations for 884 fuel assemblies and five defective fuel assemblies.” To comply with 10 CFR 50.68(b)(4), Westinghouse submitted and the NRC approved a criticality analysis documented in APP-GW-GLR-029P, Revision 3, “AP1000 Spent Fuel Storage Racks Criticality Analysis,” (ADAMS Accession No. ML110670300), which describes the evaluation to determine the minimum boron concentration under credible abnormal and accident conditions. These conditions included spent fuel pool temperature changes, a misloaded fresh fuel assembly, and a horizontal and vertical dropped assembly. The analysis concluded that a minimum soluble boron concentration level of 800 parts per million (ppm) in the spent fuel pool is required to maintain the k -effective < 0.95 during abnormal and accident conditions.

To ensure that an adequate margin is maintained so the credited concentration is always available, TS LCO 3.7.11 imposes a conservative spent fuel pool boron concentration limit of ≥ 2300 ppm. The Applicability for this LCO is defined as “When fuel assemblies are stored in the spent fuel pool and a spent fuel pool storage verification has not been performed since the last movement of fuel assemblies in the spent fuel pool.” The immediate required actions include (A.1) suspend fuel movement and either (A.2.1) restore boron concentration to within limit or (A.2.2) perform a spent fuel pool storage verification. Since the criticality analysis requires a boron concentration of 800 ppm, the staff agrees that removal of the option to exit the LCO through conducting a spent fuel pool storage verification alone, without restoration of boron, is appropriate. Elimination of that TS option ensures that the action to restore boron concentration within limit will be entered prior to exiting the LCO. Similarly, the proposed change to the Applicability is conservative and ensures the LCO applies even after a spent fuel pool storage verification has been performed. The requirements of TS LCO 3.7.11, to maintain the spent fuel pool boron concentration at ≥ 2300 ppm, will continue to be met by Required Actions A.1 and A.2. Therefore, the staff finds the SNC proposed revision acceptable.

Based on this finding, the staff concludes that there is reasonable assurance that the requirements of GDC 60, GDC 61, GDC 62 and 10 CFR 50.68 will continue to be met.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Georgia State official was notified of the proposed issuance of the amendment on December 4, 2019. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (Federal Register, 84 FR 36964, dated July 30, 2019). 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 3.1 that there is reasonable assurance that: (1) the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public. Therefore, the staff finds the changes proposed in this license amendment acceptable.

7.0 REFERENCES

1. Southern Nuclear Operating Company, Vogtle Electric Generating Plant Units 3 and 4, Request for License Amendment: Spent Fuel Pool Boron Concentration Applicability and Actions (LAR 19-012), June 18, 2019 (ADAMS Accession No. ML19169A350).
2. Vogtle Electric Generating Plant, Units 3 and 4, Updated Final Safety Analysis Report, Revision 8, June 14, 2019 (ADAMS Accession No. ML19171A096).
3. AP1000 Design Control Document, Revision 19, June 13, 2011 (ADAMS Accession No. ML11171A500).
4. Vogtle Electric Generating Plant, Unit 3, Current Facility Combined License NPF-91 (ADAMS Accession No. ML14100A106).
5. Vogtle Electric Generating Plant, Unit 4, Current Facility Combined License NPF-92 (ADAMS Accession No. ML14100A135).
6. Vogtle Electric Generating Plant Final Safety Evaluation Report, NUREG-2124, Volume 2, "Final Safety Evaluation Report Related to the Combined Licenses for Vogtle Electric Generating Plant, Units 3 and 4," dated September 30, 2012 (ADAMS Accession No. ML12271A048).
7. NUREG-1793, Volume 2, Supplement 2, "Final Safety Evaluation Report Related to Certification of the AP1000 Standard Plant Design," dated September 30, 2011 (ADAMS Accession No. ML11293A073).

8. NUREG-0800, Standard Review Plan, Section 9.1.2, Revision 4, "New and Spent Fuel Storage," dated March 2007, (ADAMS Accession No. ML070380206).
9. APP-GW-GLR-029P, Revision 3, "AP1000 Spent Fuel Storage Racks Criticality Analysis," dated March 3, 2011 (ADAMS Accession No. ML110670300).