



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

March 11, 2020

MEMORANDUM TO: Victor E. Hall, Chief  
Vogtle Project Office  
Office of Nuclear Reactor Regulation

FROM: Cayetano Santos, Senior Project Manager */RA/*  
Vogtle Project Office  
Office of Nuclear Reactor Regulation

SUBJECT: AUDIT REPORT FOR VOGTLE ELECTRIC GENERATING  
PLANT, UNITS 3 AND 4, REQUEST FOR LICENSE  
AMENDMENT AND EXEMPTION: AUTOMATIC  
DEPRESSURIZATION SYSTEM (ADS) AND CORE MAKEUP  
TANK (CMT) DESIGN PARAMETERS (LAR 19-009)

By letter dated September 30, 2019 (Agencywide Documents Access and Management System (ADAMS) Accession Number ML19273A953), as supplemented by letter dated December 19, 2019 (ADAMS Accession No. ML19353B752), Southern Nuclear Operating Company (SNC) requested an amendment to Combined License (COL) Numbers NPF-91 and NPF-92, for Vogtle Electric Generating Plant (VEGP) Units 3 and 4.

The proposed amendment revises the licensing basis documents to reflect revised automatic depressurization system (ADS) and core makeup tank (CMT) design parameters. The requested amendment requires a departure from the Updated Final Safety Analysis Report (UFSAR) Tier 2 information that involves a change to the plant-specific Tier 1 (and associated COL Appendix C) information in Table 2.1.2-4 identifying a) the maximum stroke times for the ADS Stages 1, 2, and 3 valves, and b) the minimum effective flow areas for the ADS Stages 2 and 3 valves. The requested amendment also requires a departure from the UFSAR Tier 2 information that involves a change to the COL Appendix A information in Technical Specification (TS) 3.5.2 and TS 3.5.3 identifying the required CMT minimum volume. Editorial changes are also provided for TS 3.5.3.

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The Nuclear Methods, Systems, and New Reactors Branch (DSS/SNRB) and PRA Licensing Branch C (DRA/APLC) staff conducted an audit on January 7, 2020 – February 5, 2020. The purpose of the audit was to review the documentation and calculations needed by the U.S. Nuclear Regulatory Commission (NRC) staff to verify the information and conclusions in License Amendment Request 19-009.

Docket Nos.: 52-025 and 52-026

Enclosure:  
Regulatory Audit Report

cc: See next page

U.S. NUCLEAR REGULATORY COMMISSION AUDIT REPORT FOR VOGTLE ELECTRIC GENERATING PLANT UNITS 3 AND 4, REQUEST FOR LICENSE AMENDMENT: REQUEST FOR LICENSE AMENDMENT AND EXEMPTION: AUTOMATIC DEPRESSURIZATION SYSTEM (ADS) AND CORE MAKEUP TANK (CMT) DESIGN PARAMETERS (LAR-19-009) DATED: JANUARY 8, 2020 DATED: MARCH 11, 2020

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**ADAMS Accession Nos.: ML20065M803** **\*via e-mail** **NRO-008**

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(Revised 2/13/2020)

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**REPORT OF REGULATORY AUDIT**  
**REQUEST FOR LICENSE AMENDMENT AND EXEMPTION:**  
**AUTOMATIC DEPRESSURIZATION SYSTEM (ADS) AND CORE MAKEUP TANK (CMT)**  
**DESIGN PARAMETERS (LAR 19-009)**  
**VOGTLE ELECTRIC GENERATING PLANT, UNITS 3 AND 4**  
**DOCKET NOS. 52-025 AND 52-026**

**A. Background**

By letter dated September 30, 2019 (Reference 1), as supplemented by letter dated December 19, 2019 (Reference 2), Southern Nuclear Operating Company (SNC) requested an amendment to Combined License (COL) Numbers NPF-91 and NPF-92, for Vogtle Electric Generating Plant (VEGP) Units 3 and 4 (References 4 and 5).

License Amendment Request (LAR) 19-009 requests revisions to the licensing basis documents to reflect revised automatic depressurization system (ADS) and core makeup tank (CMT) design parameters. The requested amendment requires a departure from the Updated Final Safety Analysis Report (UFSAR) Tier 2 information that involves a change to the plant-specific Tier 1 (and associated COL Appendix C) information in Table 2.1.2-4 identifying a) the maximum stroke times for the ADS Stages 1, 2, and 3 valves, and b) the minimum effective flow areas for the ADS Stages 2 and 3 valves. The requested amendment also requires a departure from the UFSAR Tier 2 information that involves a change to the COL Appendix A information in Technical Specification (TS) 3.5.2 and TS 3.5.3 identifying the required CMT minimum volume. Editorial changes are also provided for TS 3.5.3.

The purpose of this audit is to review the documentation and calculations needed by the U.S. Nuclear Regulatory Commission (NRC) staff to verify the information and conclusions in LAR 19-009.

**B. Regulatory Audit Basis**

This regulatory audit is based on the following:

- VEGP Units 3 and 4 Revision 8 to UFSAR, Revision 7 to Tier 1, Revision 51 to Technical Specifications Bases, June 14, 2019 (ADAMS Accession No. ML19171A093).
- VEGP Units 3 and 4 UFSAR Tier 2, Chapter 14, Revision 8, March 21, 2019 (ADAMS Accession No. ML19171A073).
- VEGP Units 3 and 4 UFSAR Tier 2, Chapter 15, Revision 8, March 21, 2019 (ADAMS Accession No. ML19171A074).
- VEGP Units 3 and 4 UFSAR Tier 2, Chapter 19, Revision 8, March 21, 2019 (ADAMS Accession No. ML19171A078).
- VEGP Units 3 and 4 Tier 1, Revision 7, March 21, 2019 (ADAMS Accession No. ML19171A045).
- VEGP Units 3 and 4 Technical Specifications Bases, Revision 51 (ADAMS Accession No. ML19171A050)

The audit plan is available in ADAMS under Accession No. ML19364A157 (Reference 3).

### **C. Logistics**

The audit was conducted from the NRC headquarters via the Westinghouse Electric Company's (Westinghouse) electronic reading room, and via telephone conferences with SNC and Westinghouse subject matter experts.

Dates: January 7, 2020 – February 5, 2020

Location: NRC Headquarters  
One White Flint North  
11555 Rockville Pike  
Rockville, MD 20852-2738

### **D. Audit Team Members**

The following NRC staff members participated in the audit:

- Ryan Nolan, Nuclear Engineer
- Marie Pohida, Senior Reliability and Risk Analyst
- Alina Schiller, Project Manager

### **E. Applicant and Industry Participants**

The following personnel from SNC and Westinghouse participated in the periodic telephone conferences:

- Eddie Grant, SNC
- Mark Humphrey, SNC
- Brad Chamberlain, SNC
- Neil Haggerty, SNC
- Anthony Schoedel, Westinghouse
- Michael Patterson, Westinghouse
- David McDevitt, Westinghouse
- Ann Marie DiLullo, Westinghouse

### **F. Documents Audited**

APP-SSAR-GSC-765, "Shutdown Evaluation for the AP1000 Plant: Loss of Normal Residual Heat Removal System (RNS) Cooling Analysis with NOTRUMP," Revision 2, December 27, 2017.

Markups to APP-SSAR-GSC-765, Revision 2, "Appendix C: Analysis of Reduced CMT Volume," September 27, 2019.

### **G. Description of Audit Activities and Summary of Observations**

LAR 19-009, in part, proposes to delete the performance of existing technical specification (TS) Surveillance Requirement (SR) 3.5.2.2 from TS SR 3.5.3.1, as well as proposes the addition of



a new TS SR. New TS SR 3.5.3.3 is created to verify the borated water volume in the CMT required to be OPERABLE when in MODE 5 with the Reactor Coolant System (RCS) not VENTED is greater than or equal to 2450 ft<sup>3</sup>. The results of a loss of Normal Residual Heat Removal System (RNS) analysis with a reduced CMT water volume from the safety analysis described in UFSAR Chapter 15 are not presented in UFSAR Chapter 19, Appendix E. Therefore, the goal of the staff's audit was to review the loss of RNS analysis and verify it adequately supports the proposed changes to the minimum CMT water volume in TS 3.5.3.

The staff notes that the loss of RNS calculation note (APP-SSAR-GSC-765) addresses several different modes of operation. For example, it covers MODE 4 and MODE 5 with the RCS intact, MODE 5 with RCS vented, MODE 5 vacuum refill, and MODE 5 mid-loop operation. The staff verified that calculation incorporated updates for the design changes to ADS Stages 1, 2, and 3, as described above, as applicable. Furthermore, the staff reviewed the calculation methods, inputs, and assumptions.

In addition, the staff reviewed markups to APP-SSAR-GSC-765, Revision 2, titled "Appendix C: Analysis of Reduced CMT Volume." The purpose of this appendix is to generate additional NOTRUMP calculations for loss of RNS cooling events during shutdown conditions with a reduced CMT volume of 2450 ft<sup>3</sup> as requested in the LAR. The results of the Appendix C calculation show that even with the new reduced volume, the in-service CMT maintains the core mixture level above the top of the active fuel for a loss of RNS cooling in shutdown MODES 4 and 5 with the RCS intact, thus satisfying the acceptance criteria.

The audit included two teleconference calls with the licensee. During the calls, the staff asked questions related to the methods and assumptions used in the loss of RNS calculation. The licensee adequately addressed all staff questions and clarifications where necessary.

## **H. Exit Briefing**

The staff conducted the audit exit briefing on February 25, 2020. The licensee and staff discussed the completion of the audit and plans for preparing a safety evaluation on LAR 19-009.

## **I. Requests for Additional Information (RAIs) Resulting from Audit**

No RAIs were issued as a result of this audit.

## **J. Open Items and Proposed Closure Paths**

No open items were identified as a result of the audit.

## **K. Deviations from Audit Plan**

The duration of the audit was extended in order to allow the staff to ask additional questions.

## **L. References**

1. Southern Nuclear Operating Company, Vogtle Electric Generating Plant Units 3 and 4, "Request for License Amendment and Exemption: Automatic Depressurization System (ADS) and Core Makeup Tank (CMT) Design Parameters (LAR 19-009)," September 30, 2019 (ADAMS Accession No. ML19273A953).

2. Southern Nuclear Operating Company, Vogtle Electric Generating Plant Units 3 and 4, "Supplement to Request for License Amendment and Exemption: Automatic Depressurization System (ADS) and Core Makeup Tank (CMT) Design Parameters (LAR 19-009S1)," December 19, 2019 (ADAMS Accession No. ML19353B752).
3. Audit plan for Vogtle Electric Generating Plant Units 3 and 4, Request for License Amendment and Exemption: Automatic Depressurization System (ADS) and Core Makeup Tank (CMT) Design Parameters (LAR 19-009), January 8, 2020 (ADAMS Accession No. ML19364A157).
4. Vogtle Electric Generating Plant Unit 3, Current Facility Combined License NPF-91, revised June 13, 2019 (ADAMS Accession No. ML14100A106).
5. Vogtle Electric Generating Plant Unit 4, Current Facility Combined License NPF-92, revised June 25, 2019 (ADAMS Accession No. ML14100A135).