

U.S. NUCLEAR REGULATORY COMMISSION
AUDIT REPORT
REGULATORY AUDIT OF VOGTLE UNITS 3 AND 4
LICENSE AMENDMENT REQUEST LAR-19-10
AUXILIARY BUILDING ROOM HEAT-UP
DOCKET NOS. 52-025 AND 52-026

INTRODUCTION

On November 22, 2019, SNC submitted LAR 19-010, Auxiliary Building Room Heatup,” (Agencywide Documents Access and Management System (ADAMS) No. ML19326D430). Southern Nuclear Operating Company (SNC) is the combined license (COL) holder for Vogtle Electric Generating Plant Units 3 and 4 (VEGP), Units 3 and 4. The requested amendment includes proposed changes to the Updated Final Safety Analysis Report (UFSAR). The proposed changes include revising heat loads in Auxiliary Building spaces and the evaluations related to the revised heat loads. In the licensing amendment request (LAR), SNC stated that the evaluations demonstrate that the temperature limits of the affected rooms in the Auxiliary Building are met based on design basis accidents heat-up analysis.

To facilitate the evaluation of LAR-19-010, the U.S. Nuclear Regulatory Commission (NRC) staff conducted a regulatory audit in accordance with the Office of Nuclear Reactor Regulation Office Instruction LIC-111, “Regulatory Audits,” Revision (Rev.) 1, to examine technical information to better its understanding of the key assumptions, analyses, and test procedures used to support the licensee’s basis for a LAR.

Specifically, the staff reviewed technical information to better understand how the licensee evaluated: 1) the potential effects of the proposed changes on environmental qualification (EQ) of electrical equipment following loss of heating, ventilation, and air conditioning (HVAC) or loss of alternating current (ac) power events, and 2) the staff reviewed Auxiliary Building heat load calculations following loss of HVAC or loss of ac power events. The staff’s review of the VEGP Units 3 and 4 documentation was to determine whether the information in LAR 19-010, “Auxiliary Building Room Heat-Up,” sufficiently supported the LAR so that the staff’s review of the LAR may be completed.

REGULATORY AUDIT BASES

This regulatory audit was based on the following regulatory requirements:

- Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix A, “General Design Criteria for Nuclear Power Plants,” General Design Criterion (GDC) 4, “Environmental and Dynamic Effects Design Bases”
- 10 CFR Part 50, Appendix A, GDC 19, “Control Room”
- 10 CFR 50.49, “Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants”

This regulatory audit applied the following NRC regulatory guidance:

- NRR Office Instruction LIC-111, “Regulatory Audits,” Rev. 1

- NUREG-0800, Standard Review Plan (SRP) Section 3.11, "Environmental Qualification of Mechanical and Electrical Equipment"
- SRP Section 6.4, "Control Room Habitability System"
- SRP Section 9.4.1, "Control Room Area Ventilation System"
- SRP Section 9.4.3, "Auxiliary and Radwaste Area Ventilation System"

AUDIT TEAM

- Matthew McConnell, Lead reviewer, Electrical Engineering New Reactor and License Renewal Branch (EENB)
- Sheila Ray, EENB
- Nan (Danny) Chien, Containment and Plant Systems Branch
- Alissa Neuhausen, Probabilistic Risk Assessment Branch C
- Billy Gleaves, Vogtle Project Office, Licensing Senior Project Manager

LICENSEE STAFF CONTACTED

- Eddie Grant, SNC

AUDIT LOCATION AND DATES

This audit took place February 10 through March 16, 2020. The audit was conducted by the staff online through the Westinghouse Electric Company (WEC) electronic reading room (eRR).

DOCUMENTS AUDITED

- DCP_DCP_010071, "Subject: Input for NRC Review of Abnormal and Accident Environment Changes in Southern Company Licensing Amendment Request 19-010 (Westinghouse LAR-163)," dated January 2020
- APP-EY01-VBR-004, "Equipment Qualification Data Package for Low-Voltage Power, Control, and I&C Electrical Penetration Assemblies for Use in the AP1000 Plant," Rev. 4, January 2018
- EQ-TP-488-APP, "Pre-Seismic Environmental Qualification Test Procedure for the IDS Battery Charger (DC01), Inverter (DU01) and Regulating Transformer (DT01) for Use in the AP1000 Plant," Rev. 0, January 2020
- APP-JE52-VBR-002, "Equipment Qualification Data Package for Model DTN2070, Pressure and Differential Pressure Transmitter for Use in the AP1000 Plant," Rev. 3, October 2016
- APP-JE52-VBR-006, Equipment Qualification Data Package for NLI Differential Pressure Transmitters for Use in the AP1000 Plant," Rev.1, September 2016
- APP-PV01-VBR-012, "Equipment Qualification Data Package for Flowserve Flex Wedge Gate Valves with Limitorque Motor Operators for Use in the AP1000 Plant," Rev. 1, May 2017
- APP-PV02-VBR-010, "Equipment Qualification Data Package for PV02 Manually Operated Globe Valves for Use in the AP1000 Plant," Rev. 0, September 2016
- APP-PV03-VBR-008, "Equipment Qualification Data Package for Non-Active Equiwedge Gate Valves for Use in the AP1000 Plant," Rev. 1, January 2017
- APP-PV11-VBR-004, "Equipment Qualification Data Package for Air-Operated TRICENTRIC Butterfly Valves for Use in the AP1000 Plant," Rev. 2, March 2017

- APP-PV11-VBR-006, "Equipment Qualification Data Package for Motor-Operated TRICENTRIC Butterfly Valve for Use in the AP1000 Plant," Rev. 3, May 2017
- APP-PV14-VBR-002, "Equipment Qualification Data Package for Fisher HPNS Control Valves for Use in the AP1000 Plant," Rev. 2, January 2018
- APP-GW-VBR-001, "Equipment Qualification Summary Report for TopWorx C7 GO Switches for Use in the AP1000 Plant," Rev. 1, January 2017
- APP-GW-VBR-001, "Equipment Qualification Data Package for TopWorx C7 GO Switches for Use in the AP1000 Plant," Rev. 1, February 2017
- DCP_DCP_010071, "Subject: Input for NRC Review of Abnormal & Accident Environment Changes in Southern Company Licensing Amendment Request 19-010 (Westinghouse LAR-163)," dated January 2020
- APP-GW-GAP-420-1, "Heatup of Auxiliary Building Rooms Following a Loss of HVAC or Loss of All AC Power Change Description," Rev. 17, July 2019

AUDIT PREPARATION

The NRC staff prepared an audit plan dated February 7, 2020 (ADAMS Accession No. ML20035E207) that identified the information needed for this audit. The audit plan requested that specific documentation be made available for NRC staff's review. SNC made available specific documents in the Westinghouse eRR. The audit entrance call between NRC and SNC was made on February 11, 2020.

AUDIT SCOPE

The primary scope of this audit was the review of the SNC documentation supporting the changes requested LAR-19-010.

AUDIT PERFORMANCE

The NRC staff reviewed the previously delineated audit documents. The NRC staff's objective for the audit was to verify key assumptions, analyses, and test procedures used to support the basis for the LAR. The staff audited this information to better understand how the licensee evaluated the potential effects of the proposed changes on the EQ of electrical equipment and Main Control Room (MCR) following loss of HVAC or loss of ac power events. Specifically, since electrical equipment important to safety in affected rooms and the MCR in the Auxiliary Building will be subjected to increased temperature ranges under abnormal or accident conditions due to a revision of the VEGP Units 3 and 4 design basis accident heat-up analyses.

The NRC staff selected a representative sample of electrical components in the licensee's EQ program to audit. The representative sample was selected from a list of components affected by the proposed changes based on system risk significance, importance to defense-in-depth, and importance to RTNSS. The sample was also selected to include a range of different component types. These components included various motor-operated valves, electrical penetration assemblies, transmitters, battery chargers, and inverters. Except for the battery chargers and inverters, the staff reviewed the EQ data packages for these components, which document the EQ process/methodology and results for the component. For the battery chargers and inverters, the NRC staff reviewed the EQ test procedure since the final EQ data package is not yet complete. The NRC staff reviewed how the temperature changes in the Auxiliary Building were addressed in the EQ of the components. The NRC staff reviewed the

documents and confirmed that the selected components remain qualified (from a temperature standpoint) as a result of the proposed changes.

During the audit, NRC staff requested the licensee to explain how they assessed the impact of the proposed changes on non-safety related electrical equipment whose failure under postulated environmental conditions could prevent satisfactory accomplishments of safety functions by the safety-related equipment. In audit, the licensee clarified that the changes did not impact the EQ boundary, and therefore, isolation between safety and non-safety related equipment remains the same, and devices that serve an isolation boundary (such as our battery chargers and transformers) are not impacted by the changes or being tested to these conditions. The NRC staff also requested that the licensee clarify whether any components are being added to the EQ equipment list to comply with 10 CFR 50.49 due to the proposed changes. As part of this audit, the licensee clarified that no components were added to the EQ equipment list as a result of the proposed changes. Therefore, the previous list of equipment for satisfying 10 CFR 50.49 (b)(1), (b)(2), or (b)(3) will remain unchanged.

The NRC staff's additional objective for the audit was to verify all revised Instrumentation and Controls/Direct Current equipment rooms area temperatures from the heat-up analysis are inserted into Tier 1 and Tier 2 UFSAR. Specifically, since the MCR is regulated by GDC 19 the staff must verify that existing calculations support the conclusions that MCR habitability is not challenged, owing to increased Auxiliary Building area temperature ranges under abnormal or accident conditions, after a revision of the VEGP Units 3 and 4 design basis accident heat-up analyses. The NRC staff reviewed how the temperature changes in the Auxiliary Building were addressed in the calculations. The staff confirmed that the affected Tier 1 and Tier 2 UFSAR are revised and that calculations did support that MCR operator habitability is not affected.

CONCLUSIONS

Based on its audit of the aforementioned information, the NRC staff confirmed that the licensee evaluated the potential effects of the proposed changes on the sample of electrical equipment and supported by its analyses that MCR habitability could be maintained. Based on this audit, the NRC staff does not require the licensee to submit additional information on the docket for this LAR.

CLOSURE

Audit closed March 24, 2020.

REFERENCES

1. Southern Nuclear Operating Company, Vogtle Electric Generating Plant Units 3 and 4, Request for License Amendment and Exemption, "Auxiliary Building Room Heat-up," dated November 22, 2019 (ADAMS Accession No. ML19326D430).
2. NRO-REG-108, "Regulatory Audits," dated April 2, 2009 (ADAMS Accession No. ML081910260).
3. Audit Plan for Vogtle Electric Generating Plant Units 3 and 4, Request for License Amendment and Exemption: Auxiliary Building Room Heat-up (LAR-19-010), dated February 7, 2020 (ADAMS Accession No. ML20035E207).