

## Vogle PEmails

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**From:** Gleaves, Bill  
**Sent:** Friday, November 9, 2018 6:41 AM  
**To:** Adam Quarles (AGQUARLE@southernco.com)  
**Cc:** Chamberlain, Amy Christine; Lupold, Timothy; Dixon-Herrity, Jennifer; Jackson, Diane; Stubbs, Angelo; Hernandez, Raul; Chien, Nan; Li, Yueh-Li; Scarbrough, Thomas; Wong, Yuken; Tsirigotis, Alexander; Patel, Pravin; Khan, Maryam; Sweat, Tarico; Bowman, Gregory; Green, Brian; Patterson, Malcolm; Vogle PEmails  
**Subject:** Vogle LAR-18-021 Final Audit Plan on "Power Operated Relief Valve Noise Mitigation"  
**Attachments:** Vogle LAR-18-021 Final Audit Plan.pdf

Adam,

Attached is the Final Audit Plan for the regulatory audit of Vogle 3&4 LAR 18-021, "Power Operated Relief Valve Noise Mitigation," submitted by letters dated 8.10.18 and 10.11.18.

This has been updated to include all the latest document review needs as identified by the staff to date. However, as the review evolves, other information may be requested for review as part of the audit.

I believe that this has been reviewed for sensitive information and has been found by SNC to contain none. If this is found to be incorrect, please let me know ASAP as this document will automatically be released to the public in 7 days.

Respectfully,  
Billy

William (Billy) Gleaves  
Senior Project Manager  
NRO/DLSE/Licensing Branch 4 (soon to be Licensing Branch 2)  
US Nuclear Regulatory Commission

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**Created By:** Bill.Gleaves@nrc.gov

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**U.S. NUCLEAR REGULATORY COMMISSION  
REGULATORY AUDIT OF  
VOGTLE UNITS 3 AND 4 LICENSE AMENDMENT REQUEST LAR-18-021  
POWER OPERATED RELIEF VALVE NOISE MITIGATION**

11/08/2018

Docket Nos. 52-025 and 52-026

**FINAL AUDIT PLAN**

**LICENSEE:** Southern Nuclear Operating Company

**LICENSEE CONTACT:** Adam Quarles

**LOCATION:** U.S. Nuclear Regulatory Commission  
One White Flint North  
11555 Rockville Pike  
Rockville, Maryland 20852

**I. BACKGROUND**

By letter dated August 10, 2018, Southern Nuclear Operating Company (SNC) submitted License Amendment Request LAR-18-021, "Power Operated Relief Valve (PORV) Noise Mitigation," including a regulatory exemption request, for the combined licenses (COLs) for the Vogtle Electric Generating Plant (VEGP) Units 3 and 4 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18222A599). By letter dated October 11, 2018, SNC submitted Revision 1 to LAR-18-021 (ADAMS Accession No. ML18284A447).

LAR-18-021 includes a proposed change to revise the VEGP Units 3 and 4 COLs by relocating the PORV branch lines upstream of the main steam safety valves (MSSVs) in Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) Figure 2.2.4-1 of COL Appendix C. Additionally, LAR-18-021 proposes changing the PORV block valves from gate valves to globe valves in the Updated Final Safety Analysis Report (UFSAR) and increase the line and valve size to 12" from 6". LAR-18-021 also proposes changes to plant-specific Design Control Document (DCD) Tier 2 information in the UFSAR that involve changes to COL Appendix C, and corresponding changes to plant-specific Tier 1 information. LAR-18-021 also requests the exemption necessary to implement the involved changes to the plant-specific Tier 1 information. To facilitate the NRC staff's evaluation of LAR-18-021 and to complete its safety review in a timely manner, the NRC staff is planning an audit that includes:

- Review of applicable documents provided by SNC in its electronic reading room (eRR) in support of the proposed changes described in LAR-18-021. The NRC staff may conduct telephone conferences with SNC to discuss the specific documents.
- Determination of the need for any requests for additional information (RAIs) to modify or clarify the information provided in LAR-18-021.

## II. PURPOSE AND REGULATORY AUDIT BASES

The purpose of this audit is for the staff to examine and evaluate non-docketed information as follows:

1. Verify the decoupling criteria is still met for the branch line with respect to the main header.
2. Verify the design satisfies the ASME *Boiler & Pressure Vessel Code* (BPV Code), Section III stress criteria.
3. Verify the calculated stresses meet the criteria for break exclusion.
4. Understand what the licensee means when stating no changes are made to the valve motor operator.
5. Verify that no new acoustic vibration phenomenon are introduced by increasing the size of the line or through use of a globe valve.
6. Confirm the valve design specifications invoke ASME Standard QME-1-2007 for PORV block valve qualification.

The NRC regulations in 10 CFR Part 52, Appendix D, VIII.A.4 state that exemptions from Tier 1 information are governed by the requirements in 10 CFR 52.63(b)(1) and 52.98(f). In particular, 10 CFR 52.63(b)(1) allows a licensee who references a design certification rule to request an exemption from Tier 1 information. Further, 10 CFR 52.98(f) requires NRC approval for any modification to, addition to, or deletion from the terms and conditions of a COL. The proposed changes in LAR-18-021 involve changes to COL Appendix C, with corresponding changes to Tier 1 information in the plant-specific DCD for VEGP Units 3 and 4. Therefore, NRC approval is required prior to making the proposed plant-specific changes in LAR-18-021.

The NRC regulations in 10 CFR Part 52, Appendix D, Section VIII.B.5.a allow a licensee who references Appendix D 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 Section VIII. The proposed changes in LAR-18-021 to UFSAR Figure 10.3.2-1 and Table 6.2.3-1 involve changes to Tier 1 information. Therefore, LAR-18-021 includes an exemption request.

The NRC regulations in 10 CFR Part 50, Appendix A, General Design Criterion (GDC) 1, "Quality standards and records," require that structures, systems, and components (SSCs) important to safety shall be designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety functions to be performed. A quality assurance program shall be established and implemented in order to provide adequate assurance that these SSCs will satisfactorily perform their safety functions. Appropriate records of the design, fabrication, erection, and testing of SSCs important to safety shall be maintained by or under the control of the nuclear power unit licensee throughout the life of the unit. SNC needs to demonstrate that the requirements and limits in the ASME BPV Code, Section III, as incorporated by 10 CFR 50.55a, have been satisfied by the proposed changes in LAR-18-021.

The NRC regulations in 10 CFR Part 50, Appendix A, GDC 4, “Environmental and dynamic effects design bases,” require that SSCs important to safety shall be designed to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including loss-of-coolant accidents. These SSCs shall be appropriately protected against dynamic effects, including the effects of missiles, pipe whipping, and discharging fluids, that may result from equipment failures and from events and conditions outside the nuclear power unit. However, dynamic effects associated with postulated pipe ruptures in nuclear power units may be excluded from the design basis when analyses reviewed and approved by the Commission demonstrate that the probability of fluid system piping rupture is extremely low under conditions consistent with the design basis for the piping. SNC needs to demonstrate that the UFSAR break exclusion pipe stress criteria have been satisfied.

### III. REGULATORY AUDIT SCOPE

The scope of this audit will include the following topics:

#### Stress Analysis of PORV Modification

ASME *Boiler & Pressure Vessel Code* (BPV Code), Section III, incorporated by reference in 10 CFR 50.55a, requires that piping analysis consider combinations of various loadings, including deadweight, pressure, seismic, thermal expansion and transient loads. LAR-18-021 proposes changes to the main steam (MS) branch line containing the PORV, including relocating where the PORV branch line connects to the MS line, increasing the size of the PORV branch line, reducing the PORV branch line length, and changing the PORV block valve size and type. To evaluate whether the structural integrity of the applicable SSCs will be maintained within acceptable design-basis limits as a result of the proposed changes in LAR 18-021, the NRC staff will review the following information:

- (a) The MS PORV branch line had been decoupled from the MS line for the pipe stress analysis. The branch line is proposed to be changed from 6-inches to 12-inches nominal pipe size (NPS). The NRC staff will review the minimum wall thickness or schedule of the planned 12 NPS branch line. If the PORV branch line remains decoupled in the revised calculations, the staff will determine whether the proposed 12-inch branch line remains justified to be decoupled from the MS line using the current design-basis decoupling criteria.
- (b) The NRC staff will review the effects of the proposed changes in LAR-18-021 on the structural integrity of the applicable SSCs. For the MS line and the PORV branch line, the staff will review the maximum pipe stresses compared to the design-basis ASME allowable values. The staff will also review the results of the evaluation of the MS containment penetration, applicable existing supports, and any additional supports to be installed.
- (c) The staff will review the maximum pipe stresses compared to the design-basis break exclusion criteria as described in the UFSAR. The staff will review the demonstration that the subject piping meets the applicable break exclusion criteria described in UFSAR Sections 3.6.2.1.1.4 and 3.6.2.1.1.2 and the proposed changes do not result in any new postulated break locations. This is to verify there is no impact to the conclusions of the Pipe Rupture Hazard Analysis.

## Vibration and Valve Performance for PORV Modification

1. The NRC staff will review the licensee's evaluation to determine that the planned modification for the PORV block valve and branch line will not result in vibration levels that exceed the allowable limits.
2. The NRC staff will review the plans to satisfy the provisions in ASME QME-1-2007 for the dynamic, environmental, and functional qualification of the new PORV block valves consistent with the VEGP Units 3 and 4 UFSAR.
3. The NRC staff will evaluate the statements in Vogtle LAR-18-021 in Section 2 of Enclosure 1 on page 11 that there will be "no change to the valve motor operator" and "no change to the valve stroke time" in light of the potential differences in stroke length and operating requirements between the original 6-inch gate valve and the new 12-inch globe valve.

### **IV. DOCUMENTS/INFORMATION NECESSARY FOR THE AUDIT**

SNC should make available documents pertaining to the review areas listed in Section III of this audit plan. The documents to be provided by SNC to support the audit include the following:

APP-SGS-PLR-050, Revision 3  
APP-SGS-PLR-060, Revision 3  
APP-GW-P1-001, Revision 1  
APP-PV01-Z0D-208, Revision 0  
APP-PV01-Z0-001, Revision 9  
APP-GW-VP-010, Revision 3  
APP-PL02-Z0-102, Revision 4  
APP-GW-N1-001, Revision 5

### **V. TEAM ASSIGNMENTS**

Yueh-Li Li (NRO/DEI/MEB Senior Mechanical Engineer) – Break exclusion criteria  
Thomas G. Scarbrough (NRO/DEI/MEB Senior Mechanical Engineer) – Valve qualification  
Yuken Wong (NRO/DEI/MEB Senior Mechanical Engineer) – Acoustic vibration  
Alexander Tsirigotis (NRO/DEI/MEB Mechanical Engineer) – ASME pipe and support stress evaluations  
Billy Gleaves (NRO/LB4 Project Manager) – Project management oversight

### **VI. LOGISTICS**

The audit will begin with a telephone conference conducted beginning on November 5, 2018, and ending on November 9, 2018, at the NRC Rockville office.

The audit documents are located on the Westinghouse eRR and will be accessed by the staff for reading only thru a computer connection from NRC headquarters.

### **VII. SPECIAL REQUESTS**

The NRC staff requests that documents associated with the topic areas listed in Section IV be available to NRC auditors. The NRC staff will schedule a conference call to discuss the details in these documents and their audit findings following its review.

## **VIII. AUDIT ACTIVITIES AND DELIVERABLES**

The NRC staff will perform the audit by reviewing the documentation made available in the eRR by SNC. The staff will review the documents from their NRC workstations. If necessary, the staff will conduct meetings or telephone conferences with SNC to discuss issues or questions regarding the documents.

The NRC staff acknowledges the proprietary nature of the information requested and will handle it appropriately throughout the audit. While the NRC staff will take notes, the NRC staff will not remove hard copies or electronic files from the eRR.

The NRC staff will conduct a non-public entrance telephone conference on the first day of the audit, November 5, 2018, and a non-public telephone conference on November 9, 2018, at the end of the audit to present audit results. The staff will prepare an audit report to document the results of the audit. This report will be made publicly available in ADAMS.

The audit will assist the NRC staff in determining if additional RAIs will be necessary to complete the review of LAR-18-021.

If necessary, any circumstances related to the conductance of the audit will be communicated to the NRC project manager, Billy Gleaves, 301-415-5848.

## **IX. REFERENCES**

1. Southern Nuclear Operating Company, Vogtle Electric Generating Plant Units 3 and 4, Request for License Amendment and Exemption LAR-18-021, "Power Operated Relief Valve (PORV) Noise Mitigation," dated August 10, 2018 (ADAMS Accession No. ML18222A599).
2. Southern Nuclear Operating Company, Vogtle Electric Generating Plant Units 3 and 4, Request for License Amendment and Exemption LAR-18-021, Revision 1, "Power Operated Relief Valve (PORV) Noise Mitigation," dated October 11, 2018 (ADAMS Accession No. ML18284A447).
3. NRO-REG-108, "Regulatory Audits," dated April 2, 2009 (ADAMS Accession No. ML081910260).