



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

June 25, 2018

MEMORANDUM TO: Jennifer Dixon-Herrity, Chief  
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Division of Licensing, Siting and  
Environmental Analysis  
Office of New Reactors

FROM: Donald Habib, Project Manager */RA/*  
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Office of New Reactors

SUBJECT: SUMMARY OF AUDIT FOR VOGTLE ELECTRIC GENERATING  
PLANT UNITS 3 AND 4, REQUEST FOR LICENSE  
AMENDMENT AND EXEMPTION: CHANGES TO TIER 2\*  
DEPARTURE EVALUATION PROCESS (LAR 17-037)

By letter dated December 21, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession Number ML17355A416), Southern Nuclear Operating Company (the licensee) requested an amendment to Combined License Numbers NPF-91 and NPF-92, for Vogtle Electric Generating Plant (VEGP) Units 3 and 4.

The requested amendment and exemption requires changes to the combined licenses in the form of a new license condition and an exemption from 10 CFR Part 52 regulations that require U.S. Nuclear Regulatory Commission (NRC) approval in order for the VEGP licensee to depart from Tier 2\* information in the VEGP Units 3 and 4 updated final safety analysis report (UFSAR).

The requested amendment proposes new criteria that, if met, would allow the licensee to revise Tier 2\* information in the UFSAR without NRC approval.

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The Structural Engineering Branch staff of the NRC Office of New Reactors participated in an audit at the VEGP Units 3 and 4 site on June 7 and 8, 2018, to gain better understanding of certain construction details that, if changed, would result in changes to Tier 2\* information in the UFSAR related to critical structures and how these changes would be handled under the licensee's proposed license condition.

Docket Nos.: 52-025 and 52-026

Enclosure:  
Audit Summary Report

cc: See next page

SUMMARY OF AUDIT FOR VOGTLE ELECTRIC GENERATING PLANT UNITS 3 AND 4,  
 REQUEST FOR LICENSE AMENDMENT AND EXEMPTION: CHANGES TO TIER 2\*  
 DEPARTURE EVALUATION PROCESS (LAR 17-037) DATED: JUNE 25, 2018

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**ADAMS Accession No.: ML18164A261; Pkg: ML18164A260 NRO-008**

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(Revised 03/13/2018)

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**Summary of Audit**  
**Vogtle Electric Generating Plant Units 3 and 4**  
**Request for License Amendment and Exemption:**  
**Changes to Tier 2\* Departure Evaluation Process (LAR 17-037)**  
**June 2018**

**Purpose**

The purpose of the audit is for the staff to observe and understand the specific structural challenges to be addressed by the “Request for License Amendment and Exemption: Changes to Tier 2\* Departure Evaluation Process (LAR 17-037),” submitted by Southern Nuclear Company (SNC), dated December 21, 2017 (References 1 and 2). This audit summary is prepared in accordance with applicable NRC guidance (Reference 3).

**Background**

Prior to the audit, the NRC staff issued Request for Additional Information (RAI) 17-037-2, dated April 12, 2018 (Reference 4). SNC subsequently transmitted two responses to the staff, dated April 25, and May 25, 2018 (References 5 and 6, respectively). The SNC responses provided draft evaluation criteria proposed to be included in a license condition that would allow SNC (the licensee) to determine what changes to Tier 2\* information related to critical sections would require NRC approval prior to implementation.

**Regulatory Basis**

This regulatory audit is based on the following:

- Title 10 *Code of Federal Regulations* (10 CFR), Appendix D to Part 52, “Design Certification Rule for the AP1000 Design”
- General Design Criteria (GDC) 2 of Appendix A to 10 CFR Part 50; Appendix S to 10 CFR Part 50, and Appendix A to 10 CFR Part 100

**Audit Location and Date**

This audit took place June 7 and 8, 2018. The audit was conducted at the Vogtle Support Center, 7821 River Road, Waynesboro, GA.

**Audit Team Members**

- Sujit Samaddar, Chief, Structural Engineering Branch
- Pravin Patel, Structural Engineer (Audit Lead)
- Vaughn Thomas, Structural Engineer
- Don Habib, Project Manager

## Licensee Staff that participated in discussions

- Jason Redd
- Ken Clough
- Amanda Pugh

## Documents Audited

SNC presented slides describing example construction details (Reference 7).

## Audit Activities and Observations

The audit activities included a physical walkdown of several structure specimens and presentation of the construction detail examples. Photographs of three example structure specimens were provided to the staff (References 8, 9, and 10)

The staff made the following observations:

- Currently there are no known structural issues that are hindering construction progress.
  - All examples presented to the staff were illustrations of potential construction field problems that are likely to occur during the construction of a nuclear power plant, including but not limited to, structural detailing and field run commodities, i.e., cable trays, heating, ventilation, and air conditioning (HVAC) duct openings, and pipe penetrations; issues with the removal of temporary construction aids, congested rebar at wall intersections, and other details that are not included in the approved design sketches.
  - It was noted that these are routine field problems that are being addressed through standard field construction monitoring processes, and the licensee intends to address those routine issues during the reconciliation process between the as built and the approved design. The reconciliation report (as required under inspection, test, analysis, and acceptance criteria (ITAAC) 3.3.00.02a.ii) will capture the cumulative effect of the changes continuously and be checked periodically.
- Since the licensee's proposed Tier 2\* process did not account for the cumulative impact of multiple changes of these types, the licensee agreed that such a process needs to be addressed in the LAR.
- SNC discussed using LAR 17-037 to establish a screening process that would allow certain Tier 2\* structural changes, including certain field changes, so that they did not require NRC review but would account for the cumulative impact of multiple changes.
  - All the construction field issues would be tracked and addressed in the reconciliation program, both to identify the individual changes and the cumulative impact of the changes on the approved design and demonstrate that the as-built plant is within the approved safety envelope.



- SNC's proposed license condition would require a screening process for the construction issues as well as an auditable process to evaluate the cumulative impact of multiple changes.
  - The steel-concrete (SC) module construction would have no changes from the approved configurations without NRC approval.
  - Using the proposed screening process, any attachments to the SC construction such as slab support brackets could be modified by the licensee without NRC approval provided that the change is in accordance with the appropriate applicable code and the load and its transfer mechanism remain unchanged (i.e., a simply supported slab could not be converted to a fixed end slab).
  - The demand to capacity (D/C) ratio continues to be the parameter that would serve as the control for adherence to the approved design. Any change in the D/C ratio will require NRC approval.
  - In the UFSAR tables (e.g., Table 3H.5-3) where a specific D/C ratio is not identified, the D/C ratio would be interpreted as the average D/C ratio across the entire, "cross section of the critical section," assuming the design was based on the worst demand in an element of the finite element analysis (FEA) model and the area of steel ( $A_{st}$ ) provided was based on this element.
- The staff could not identify nor was SNC able to demonstrate that there are real construction field problems requiring changes to Tier 2\* information that they encountered previously or are currently ongoing at the construction sites for VEGP Units 3 and 4.

### **Exit Briefing**

The staff and representatives of SNC participated in an exit briefing on Friday, June 8, 2018, and communicated the observations listed above. The licensee advised that it would prepare a revised draft response that (1) clearly defines the types of changes that would require NRC approval and (2) includes for a process that accounts for the cumulative impacts of all changes affecting critical sections.

### **Request for Additional Information**

None. SNC plans to submit an updated draft response to RAI LAR 17-037-2.

### **References**

1. Audit Plan for Vogtle Electric Generating Plant Units 3 and 4, Request for License Amendment and Exemption: Changes to Tier 2\* Departure Evaluation Process (LAR 17-037), June 12, 2018 (ADAMS Accession No. ML18156A340).
2. Request for License Amendment and Exemption: Changes to Tier 2\* Departure Evaluation Process (LAR 17-037), December 21, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17355A416).
3. NRO-REG-108, "Regulatory Audits," dated April 2, 2009 (ADAMS Accession No. ML081910260).

4. Request for Additional Information LAR 17-037-2 for Structural Engineering Branch – Critical Sections, April 12, 2018, (ADAMS Accession No. ML18102B682).
5. Draft Response to RAI LAR 17-037-2 for Structural Engineering Branch – Critical Sections, April 25, 2018, (ADAMS Accession No. ML18116A009)
6. Draft Revised Response to RAI LAR 17-037-2 for Structural Engineering Branch – Critical Sections, May 25, 2018, (ADAMS Accession No. ML18145A289).
7. “Examples of Potential Application of the LAR-17-037-Proposed Tier 2\* Change Process to Critical Sections in support of June 7-8, 2018 Onsite NRC Audit, Draft” (ADAMS Accession No. ML18157A010).
8. Photo 1071 – Vogtle Unit 3, Wall 11, looking southwest at main steam line penetration reinforcement, June 7, 2018 (ADAMS Accession No. ML18164A107).
9. Photo 1081 – Vogtle Unit 3, Wall 7.3, looking north, concrete placed to approximately Elev. 117’, June 7, 2018 (ADAMS Accession No. ML18164A103).
10. Photo 1087 – Vogtle Unit 3, Wall 1, penetrations at approximately Elev. 118’ looking south, June 7, 2018 (ADAMS Accession No. ML18164A105).